



BULLETIN 256B

ADJUSTMENTS AND LUBRICATION

MODEL 28

NON-TYPING REPERFORATOR
LRPE

TELETYPE[®]
CORPORATION

SUBSIDIARY OF *Western Electric Company* INC.

CHICAGO, ILLINOIS, U. S. A.

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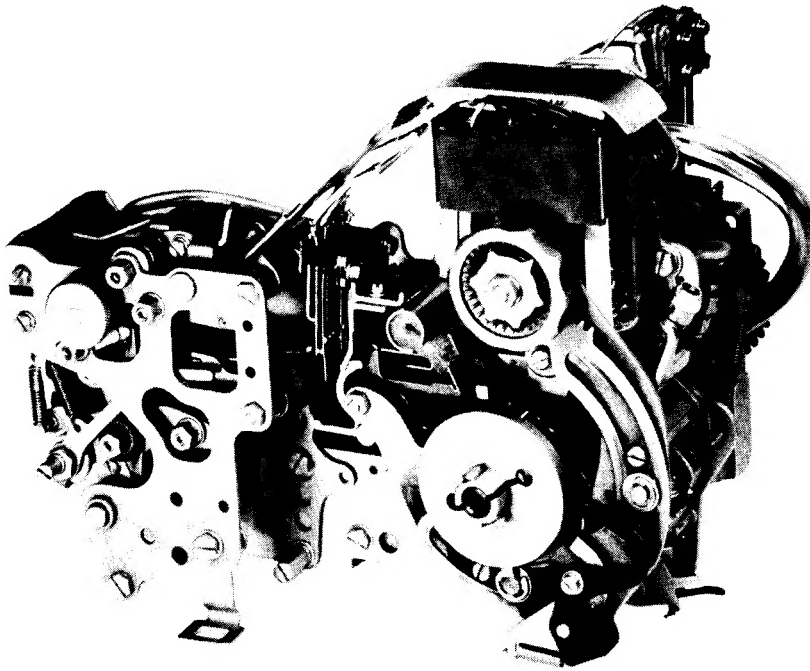
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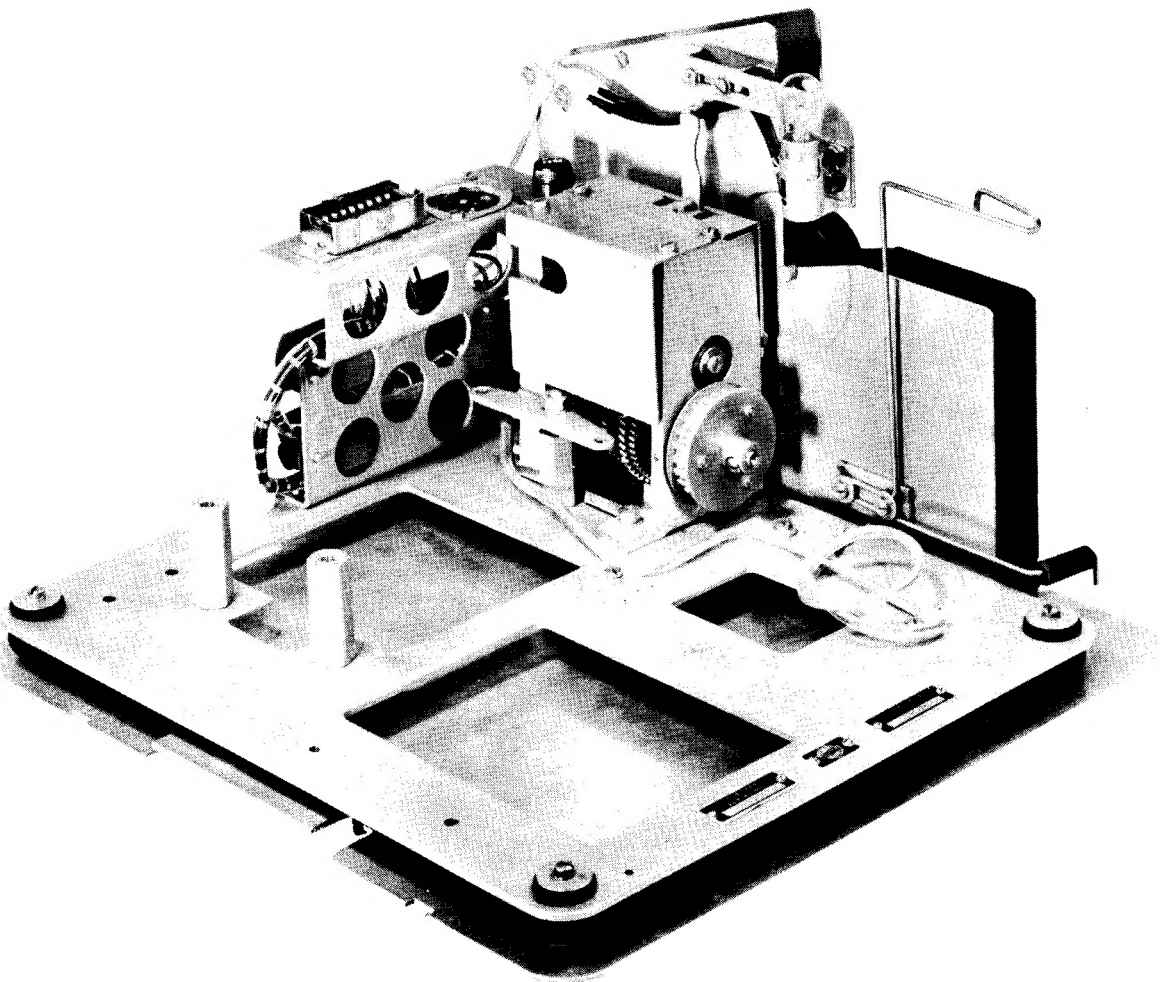
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MODEL 28 REPERFORATOR
(NON-TYPING)



MODEL 28 REPERFORATOR BASE

256B
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SECTION 1

ADJUSTMENTS AND SPRING TENSION

1. INTRODUCTION

a. This bulletin presents maintenance information for the Teletype Model 28 Non-Typing Reperforator. It is divided into three sections which cover adjustments, lubrication, and disassembly respectively.

b. It is assumed that the mechanisms illustrated in this bulletin are being viewed from a position in front of the equipment, unless the illustrations are specifically labeled otherwise. In the line drawings, pivot points are shown by circles that are solid black to indicate fixed points and cross-hatched to indicate moveable points. References in the text to LEFT or RIGHT, UP or DOWN, FRONT or REAR apply to the unit in its normal operating position with the viewer facing the selector and the punch.

2. GENERAL

a. In the adjustments and spring tensions covered in this section, location of clearances, position of parts, and point and angle of scale applications are illustrated by drawings. Requirements and procedures are set forth in the texts that accompany the drawings. The adjustments are arranged in a sequence that should be followed if a complete readjustment of the unit were undertaken. A complete adjusting procedure should be read before making the adjustment or testing spring tension.

b. Tools required to make the adjustments and check the spring tensions are not supplied with the equipment, but are listed in Teletype Bulletin 1124B. If parts are removed, all adjustments which the removal of the parts might facilitate should be made before the parts are replaced. When a part mounted on shims is removed, the number of shims at each mounting screw should be noted so that the identical shim pile-up can be made when the part is remounted. Unless stated otherwise, all nuts and screws that were loosened should be tightened after an adjustment has been made.

c. The spring tensions given in this bulletin are indicated values and should be checked with Teletype

scales in the positions shown in the drawings. Springs which do not meet the requirements, and for which there are no adjusting procedures, should be discarded and replaced by new springs.

d. When rotating the main shaft of the reperforator by hand, the clutches do not fully disengage upon reaching their stop positions. In order to relieve the drag on the clutches and permit the main shaft to rotate freely, apply a screwdriver to the stop lug of each cam disk and push in the normal direction of rotation until the latch lever falls into the notch in the cam disk. This procedure should always be followed prior to applying power to the unit or when a requirement calls for a clutch to be disengaged.

e. To manually operate the non-typing reperforator, first attach an armature clip to the selecting mechanism as follows: Carefully place the flat-formed portion of the clip over the armature between the pole pieces, and lock the extruded projection under the armature. Hook the clip's other end over the bakelite guard. The spring pressure of the clip will hold the armature in its marking (attracted) position. Rotate the main shaft counterclockwise until the clutches reach their stop position. Fully disengage the clutches as previously instructed. Release the armature momentarily, to allow the selector clutch to engage. Turn the main shaft slowly until all the push levers have fallen to the left of their selector levers. Strip the push levers from the selector levers corresponding to the spacing elements of the code combination to be processed (the push levers and selector levers are numbered in succession 1 to 5 from rear to front). The main shaft can then be rotated until the required condition is set up, or the character or function represented by the code combination is cleared through the unit.

f. All contacts should meet squarely. Smaller contacts should fall wholly within the circumference of larger mating contacts. Contacts that are the same size should not be out of alignment by more than 25% of the contact diameter. Avoid sharp kinks or bends in the contact springs.

a. NON-TYPING REPERFORATOR

NOTE

WHEN THIS EQUIPMENT IS USED ON THE REPERFORATOR TRANSMITTER SET OR THE AUTOMATIC SEND-RECEIVE KEYBOARD, SEE BULLETIN 248B OR 250B RESPECTIVELY FOR INTERRELATED ADJUSTMENTS BETWEEN THE ASSOCIATED UNIT AND THE NON-TYPING REPERFORATOR.

CLUTCH SHOE LEVER (BOTH CLUTCHES)REQUIREMENT

GAP BETWEEN CLUTCH SHOE LEVER AND ITS STOP LUG SHOULD BE 0.055 INCH TO 0.085 INCH GREATER WHEN CLUTCH IS ENGAGED THAN WHEN CLUTCH IS DISENGAGED.

TO CHECK

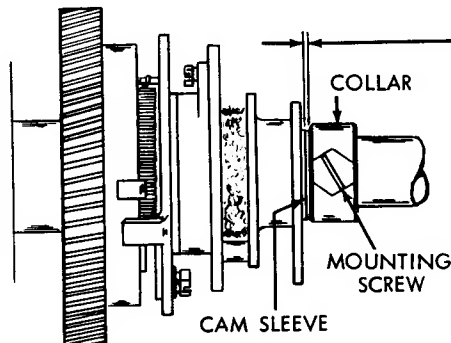
DISENGAGE CLUTCH AND MEASURE GAP. ALIGN HEAD OF DRUM MOUNTING SCREW WITH STOP LUG. ENGAGE CLUTCH. MANUALLY PRESS SHOE LEVER AGAINST STOP LUG AND ALLOW TO SNAP APART. MEASURE GAP WITH CLUTCH ENGAGED.

TO ADJUST

ENGAGE WRENCH OR SCREWDRIVER WITH LUG ON ADJUSTING DISK. ROTATE DISK WITH CLAMP SCREWS LOOSENED.

NOTE

AFTER MAKING ADJUSTMENT, DISENGAGE CLUTCH. REMOVE DRUM MOUNTING SCREW. ROTATE DRUM IN NORMAL DIRECTION AND CHECK TO SEE IF IT DRAGS ON SHOE. IF IT DOES, REFINE ADJUSTMENT.

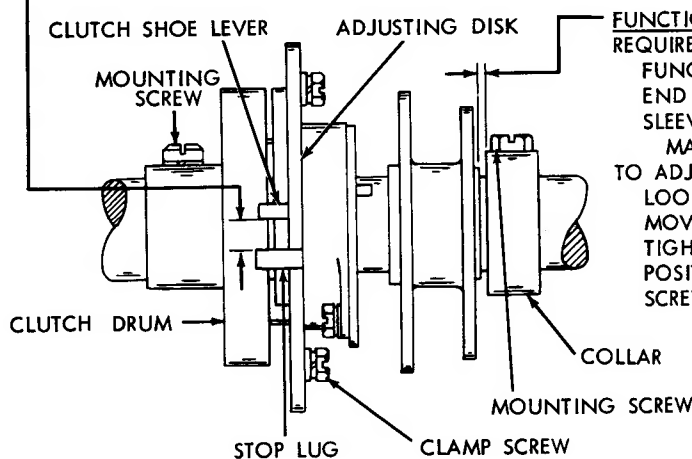
FUNCTION CLUTCH DRUM END PLAY (FOR UNITS EQUIPPED WITH TWO SHAFTS)REQUIREMENT

FUNCTION CLUTCH DISENGAGED. SOME END PLAY BETWEEN CAM SLEEVE AND COLLAR
MAX. 0.015 INCH

WHEN PLAY IS TAKEN UP TO MAKE CLEARANCE A MAXIMUM.

TO ADJUST

POSITION COLLAR WITH MOUNTING SCREW LOOSENED.

FUNCTION CLUTCH DRUM END PLAYREQUIREMENT

FUNCTION CLUTCH DISENGAGED. SOME END PLAY BETWEEN FUNCTION CAM SLEEVE AND COLLAR.
MAX. 0.010 INCH

TO ADJUST

LOOSEN DRUM MOUNTING SCREW AND MOVE DRUM TO EXTREME FRONT POSITION. TIGHTEN DRUM MOUNTING SCREW.

POSITION COLLAR WITH ITS MOUNTING SCREW LOOSENED.

FIGURE 1. FUNCTION AND SELECTOR CLUTCHES

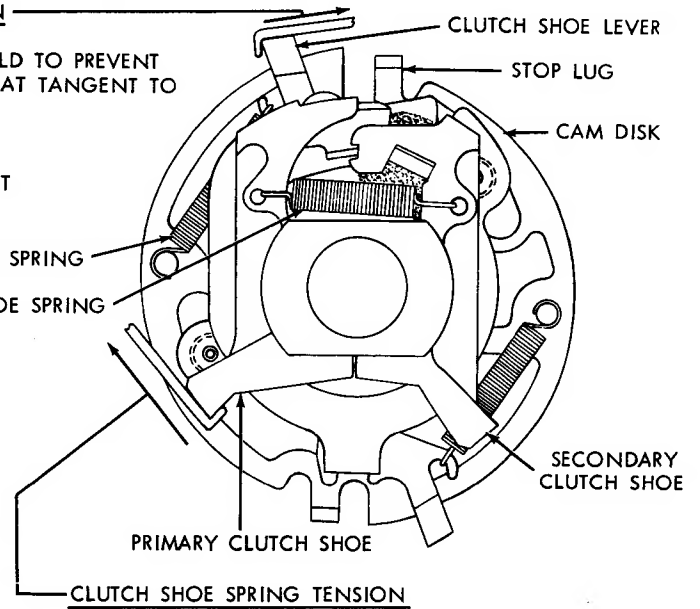
CLUTCH SHOE LEVER SPRING TENSION
REQUIREMENT

CLUTCH ENGAGED. CAM DISK HELD TO PREVENT TURNING. SPRING SCALE PULLED AT TANGENT TO CLUTCH.

MIN. 16 OZS.
MAX. 22 OZS.
TO MOVE SHOE LEVER IN CONTACT WITH STOP LUG.

CLUTCH SHOE LEVER SPRING

CLUTCH SHOE SPRING



CLUTCH SHOE SPRING TENSION
NOTE

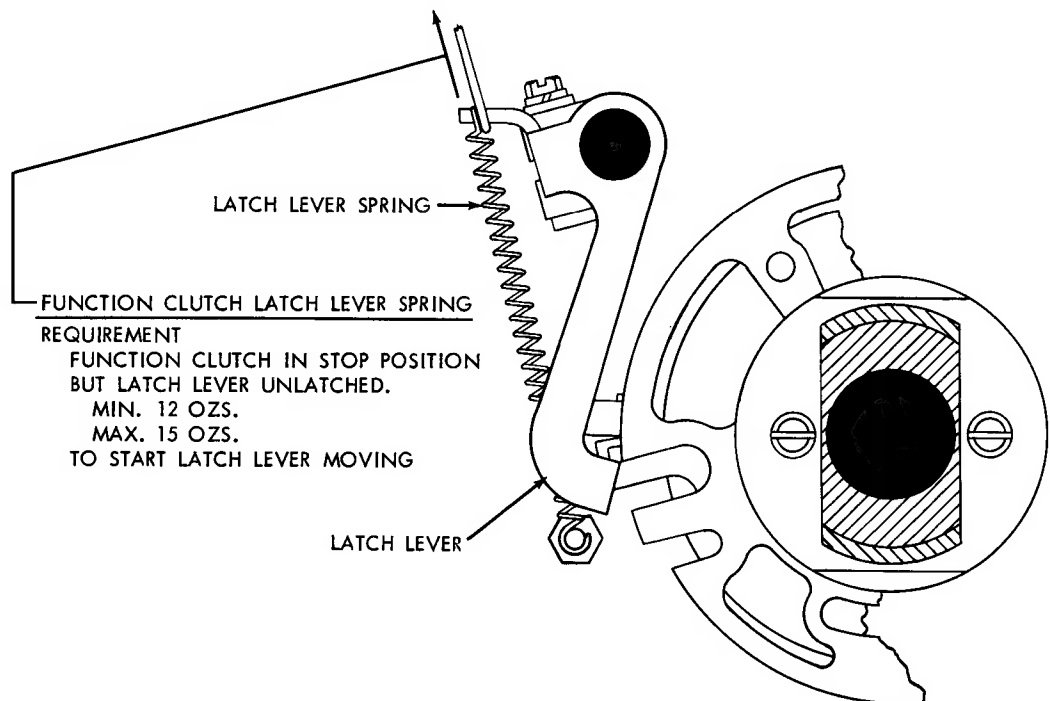
IN ORDER TO CHECK THIS SPRING TENSION, IT IS NECESSARY TO REMOVE CLUTCH FROM MAIN SHAFT. THEREFORE, IT SHOULD NOT BE CHECKED UNLESS THERE IS GOOD REASON TO BELIEVE THAT IT DOES NOT MEET ITS REQUIREMENT.

REQUIREMENT

CLUTCH DRUM REMOVED. SPRING SCALE APPLIED TO PRIMARY SHOE AT TANGENT TO FRICTION SURFACE.

MIN. 3 OZS.
MAX. 5 OZS.

TO START SHOE MOVING AWAY FROM SECONDARY SHOE AT POINT OF CONTACT.



FUNCTION CLUTCH LATCH LEVER SPRING

REQUIREMENT

FUNCTION CLUTCH IN STOP POSITION BUT LATCH LEVER UNLATCHED.

MIN. 12 OZS.
MAX. 15 OZS.

TO START LATCH LEVER MOVING

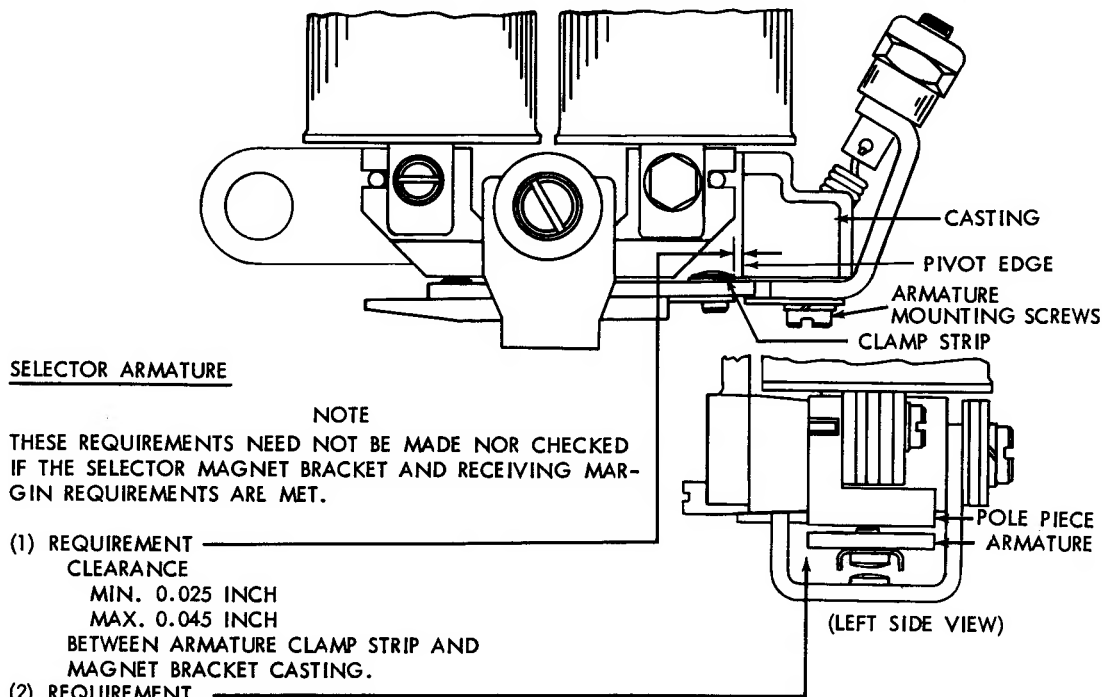
LATCH LEVER

FIGURE 2. CLUTCH SPRING TENSIONS

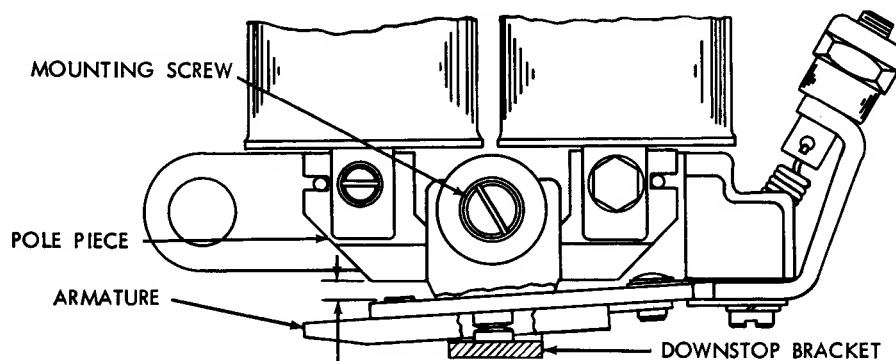
NOTE

THE ADJUSTMENTS ON PAGES 1-4 THROUGH 1-10 ARE APPLICABLE ONLY TO UNITS EQUIPPED WITH TWO CYCLE SELECTORS.

TO FACILITATE MAKING THE FOLLOWING ADJUSTMENTS, REMOVE THE RANGE FINDER ASSEMBLY AND SELECTOR MAGNET ASSEMBLY. TO INSURE BETTER OPERATION, PULL A PIECE OF CLEAN PAPER BETWEEN THE ARMATURE AND THE POLE PIECES TO REMOVE ANY OIL OR FOREIGN MATTER THAT MAY BE PRESENT. MAKE CERTAIN THAT NO LINT OR PIECES OF PAPER REMAIN BETWEEN THE POLE PIECES AND THE ARMATURE.



TO ADJUST
POSITION ARMATURE SPRING ADJUSTING NUT TO HOLD ARMATURE
FIRMLY AGAINST PIVOT EDGE OF CASTING. POSITION ARMATURE
WITH MOUNTING SCREWS LOOSENED.



REQUIREMENT

REMOVE OIL SHIELD. WITH MAGNET DE-ENERGIZED, LOCK LEVERS ON HIGH PART OF THEIR CAM, AND ARMATURE RESTING AGAINST ITS DOWNSTOP, CLEARANCE BETWEEN END OF ARMATURE AND LEFT END OF LEFT POLE PIECE.

MIN. 0.025 INCH
MAX. 0.030 INCH

TO ADJUST

POSITION DOWNSTOP BRACKET WITH MOUNTING SCREW LOOSENED. REPLACE OIL SHIELD AND CHECK OIL SHIELD ADJUSTMENT, FIGURE 6.

FIGURE 3. SELECTOR ARMATURE AND DOWNSTOP BRACKET

NOTE
REPLACE SELECTOR MAGNET ASSEMBLY
AND RANGE FINDER ASSEMBLY

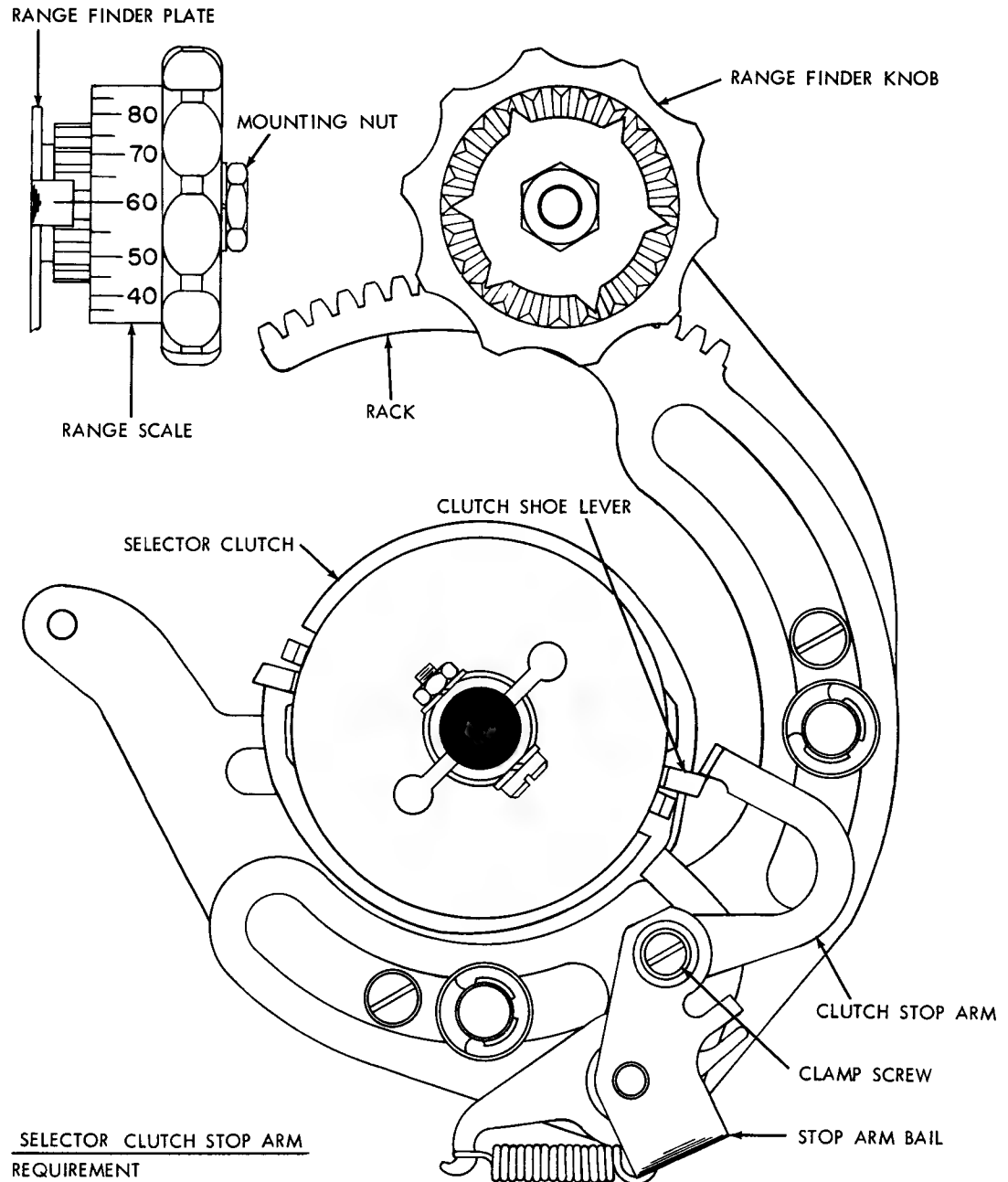
RANGE FINDER KNOB PHASING

REQUIREMENT

WITH RANGE FINDER KNOB TURNED CLOCKWISE
TO END OF RACK, ZERO MARK ON SCALE SHOULD
BE IN LINE WITH SCRIBED LINE ON RANGE
FINDER PLATE ± 6 POINTS.

TO ADJUST

POSITION KNOB WITH MOUNTING NUT LOOSENED.



SELECTOR CLUTCH STOP ARM

REQUIREMENT

RANGE SCALE SET AT 60. SELECTOR CLUTCH
DISENGAGED. ARMATURE IN MARKING POSITION.
CLUTCH STOP ARM SHOULD ENGAGE CLUTCH SHOE
LEVER BY APPROXIMATELY FULL THICKNESS OF
SHOE LEVER.

TO ADJUST

POSITION STOP ARM ON STOP ARM BAIL WITH
CLAMP SCREW LOOSENED.

FIGURE 4. RANGE FINDER MECHANISM

SELECTOR MAGNET BRACKET

(1) REQUIREMENT

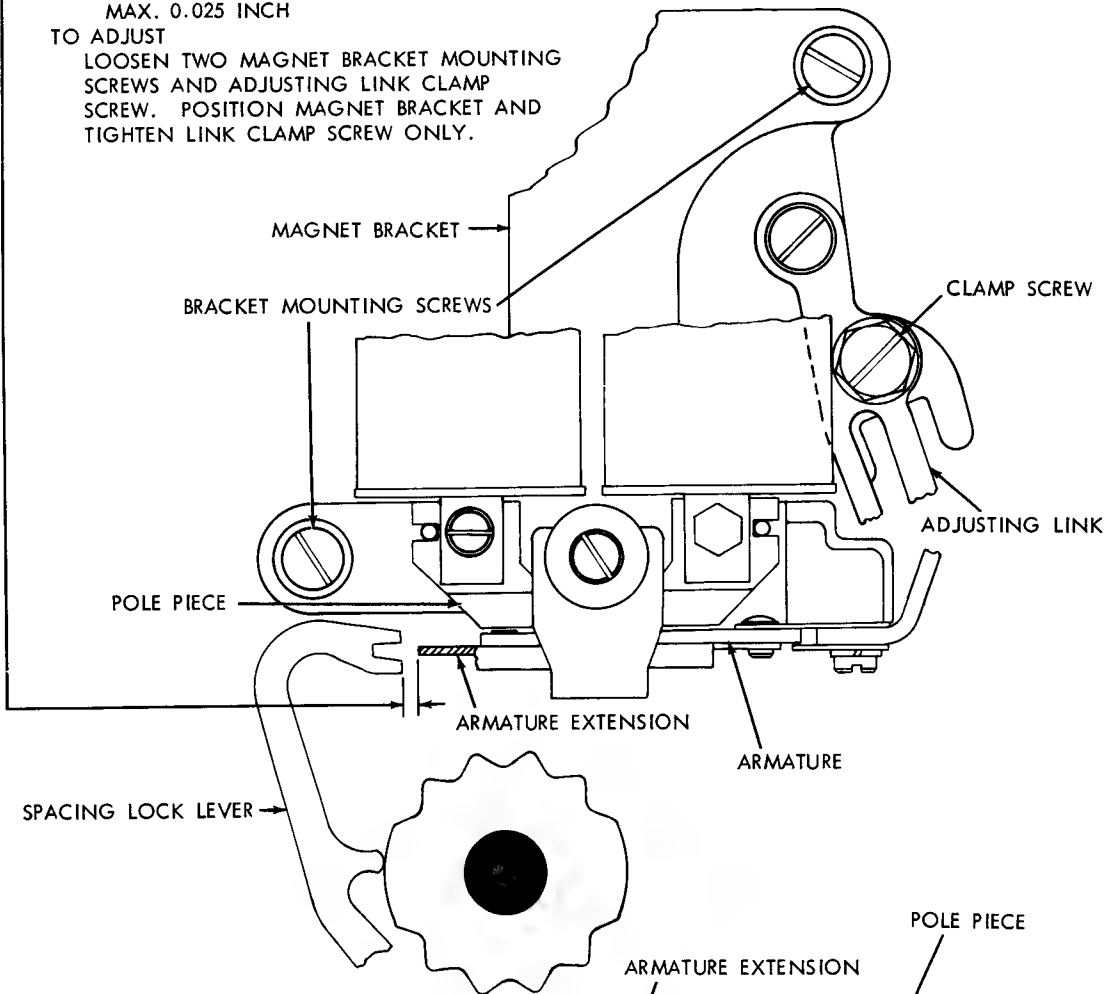
SPACING LOCK LEVER ON HIGH PART OF CAM. ARMATURE IN CONTACT WITH POLE PIECE. CLEARANCE BETWEEN SPACING LOCK LEVER AND ARMATURE EXTENSION.

MIN. 0.015 INCH

MAX. 0.025 INCH

TO ADJUST

LOOSEN TWO MAGNET BRACKET MOUNTING SCREWS AND ADJUSTING LINK CLAMP SCREW. POSITION MAGNET BRACKET AND TIGHTEN LINK CLAMP SCREW ONLY.



(2) REQUIREMENT

MARKING LOCK LEVER ON LOW PART OF CAM. MAGNET ENERGIZED. ARMATURE IN CONTACT WITH POLE PIECE. CLEARANCE BETWEEN LOWER SURFACE OF ARMATURE EXTENSION AND UPPER SURFACE OF MARKING LOCK LEVER.

MIN. 0.002 INCH

MAX. 0.005 INCH

TO ADJUST

POSITION UPPER END OF MAGNET BRACKET. TIGHTEN MOUNTING SCREWS AND RECHECK (1).

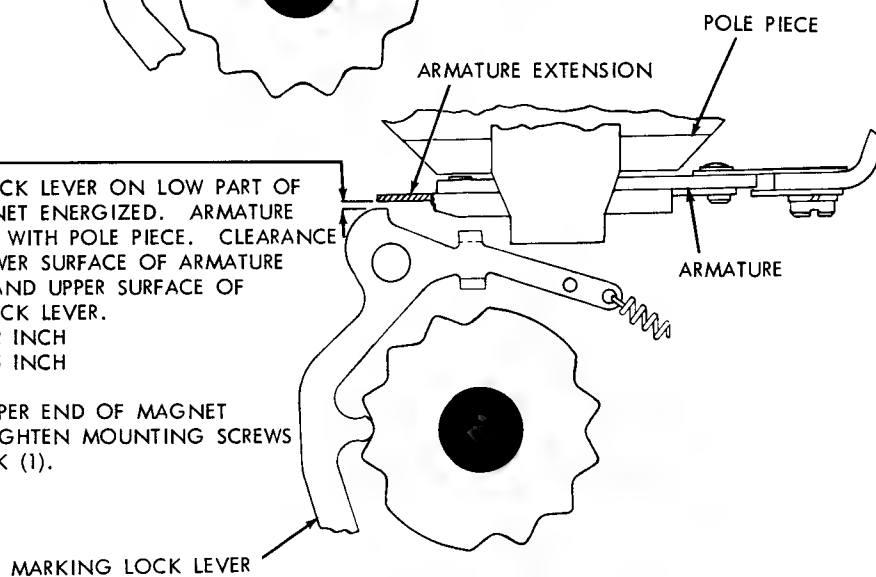
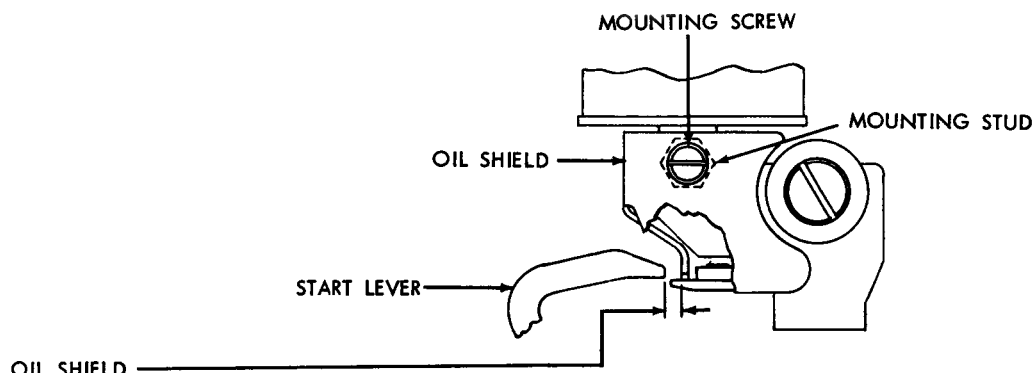


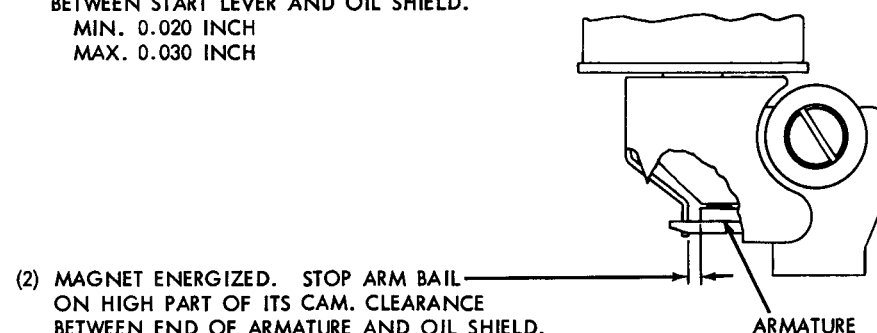
FIGURE 5. SELECTOR MAGNET BRACKET



OIL SHIELD

REQUIREMENT

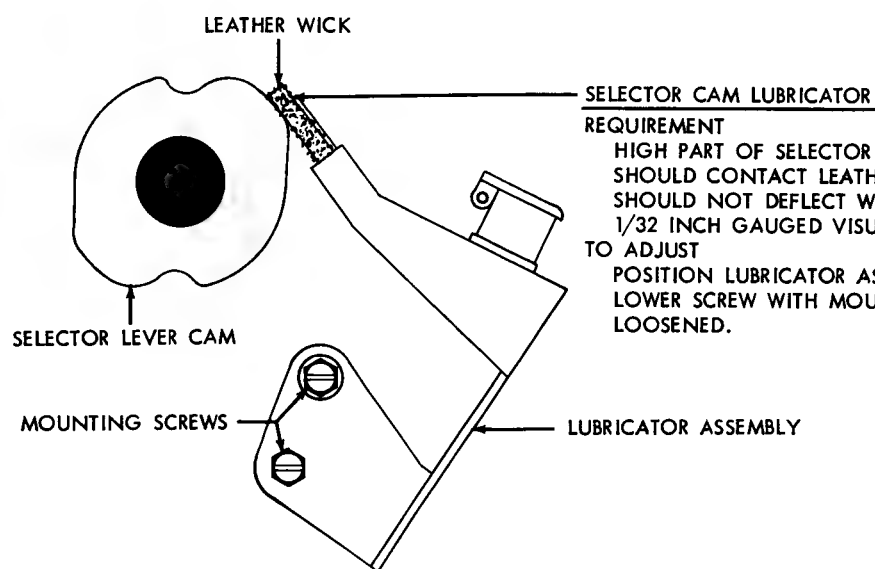
- (1) MAGNET DE-ENERGIZED. STOP ARM BAIL ON LOW PART OF ITS CAM. CLEARANCE BETWEEN START LEVER AND OIL SHIELD.
 MIN. 0.020 INCH
 MAX. 0.030 INCH



- (2) MAGNET ENERGIZED. STOP ARM BAIL ON HIGH PART OF ITS CAM. CLEARANCE BETWEEN END OF ARMATURE AND OIL SHIELD.
 MIN. 0.010 INCH

TO ADJUST

POSITION SHIELD WITH MOUNTING SCREW LOOSENED. MAKE SURE OIL SHIELD MOUNTING STUD IS SECURE BEFORE MAKING ADJUSTMENT.



SELECTOR CAM LUBRICATOR

REQUIREMENT

HIGH PART OF SELECTOR LEVER CAMS SHOULD CONTACT LEATHER WICK BUT SHOULD NOT DEFLECT WICK MORE THAN 1/32 INCH GAUGED VISUALLY.

TO ADJUST

POSITION LUBRICATOR ASSEMBLY AROUND LOWER SCREW WITH MOUNTING SCREWS LOOSENED.

FIGURE 6. OIL SHIELD AND SELECTOR CAM LUBRICATOR

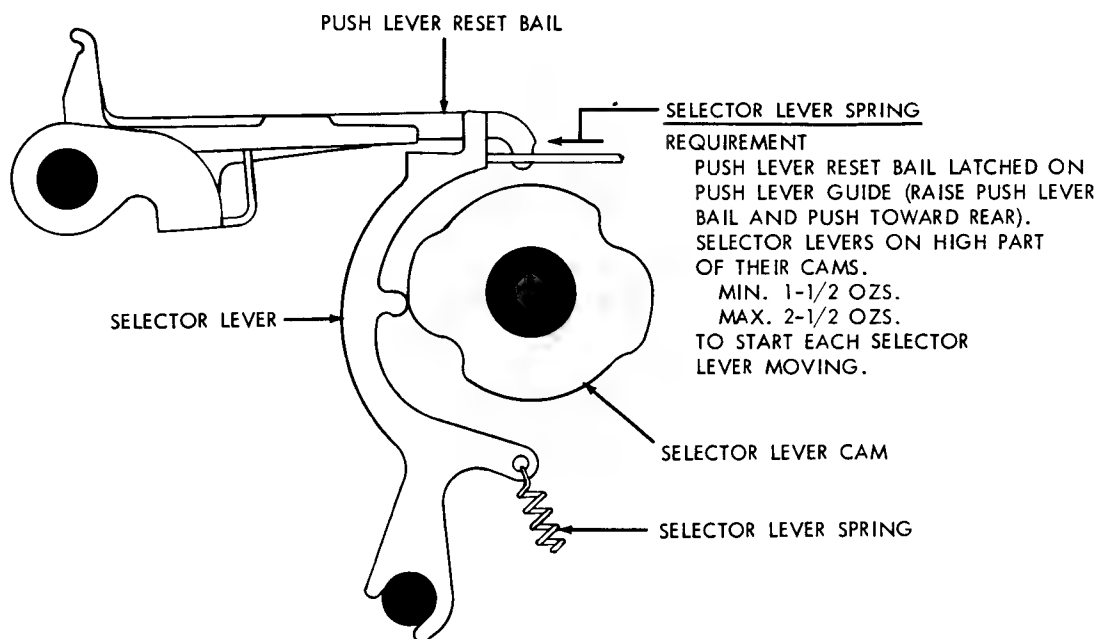
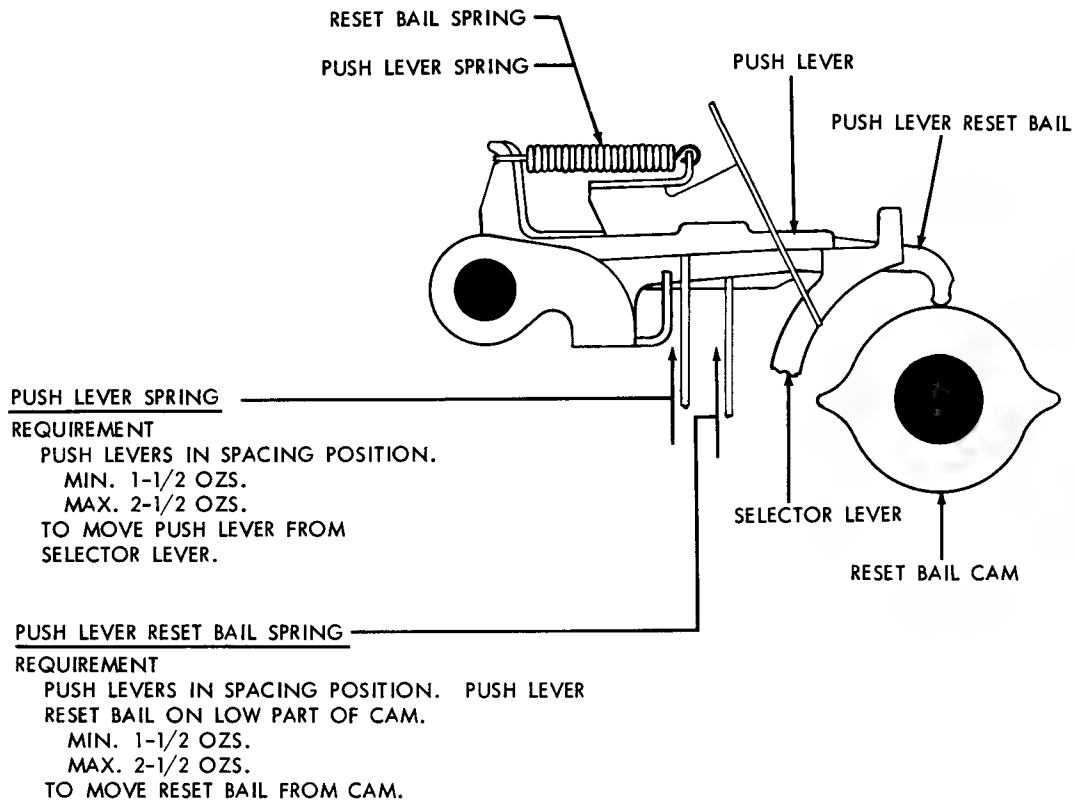


FIGURE 7. SELECTOR MECHANISM SPRINGS

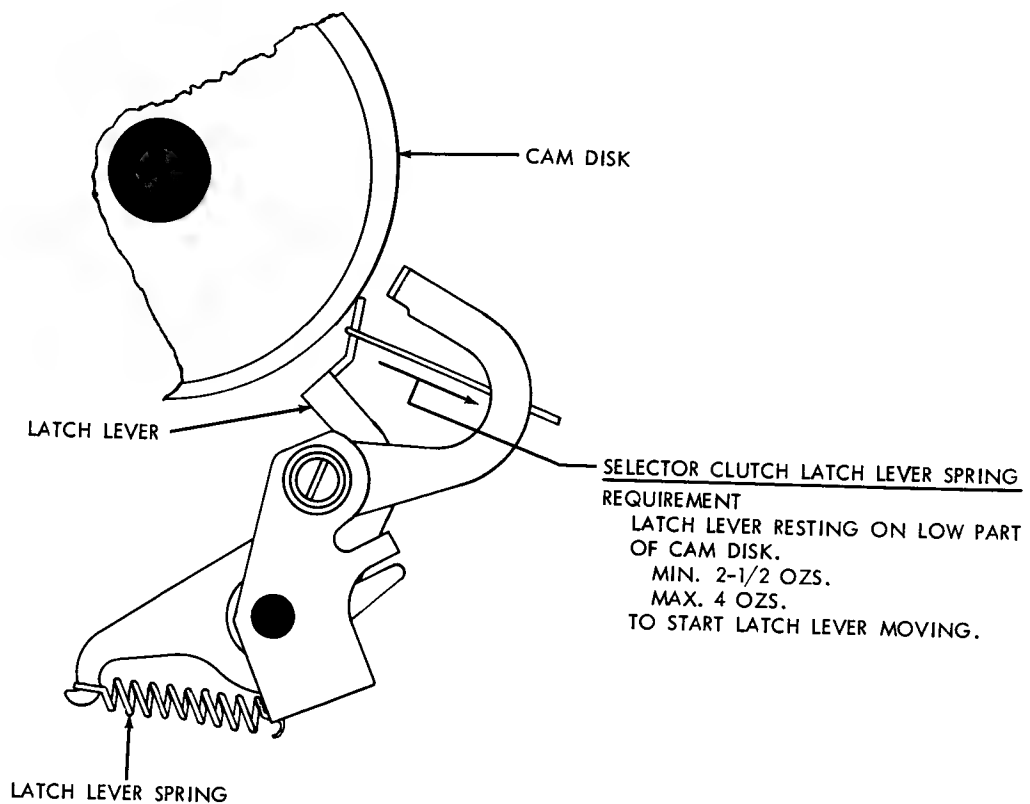
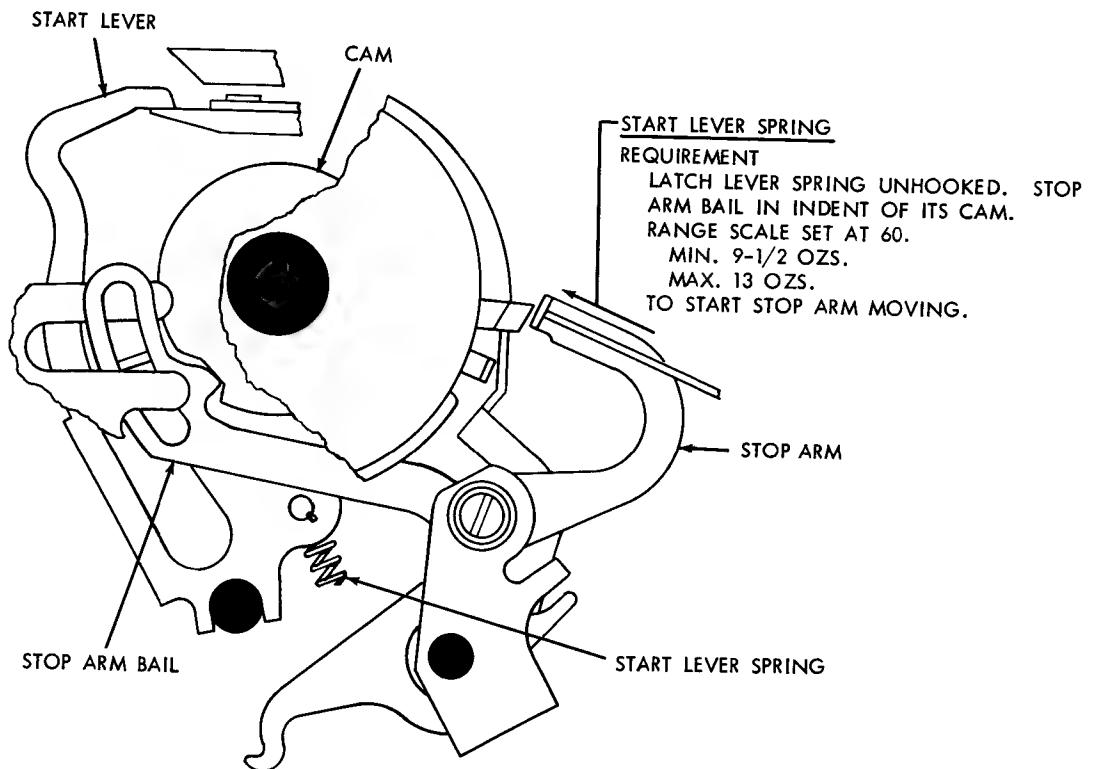
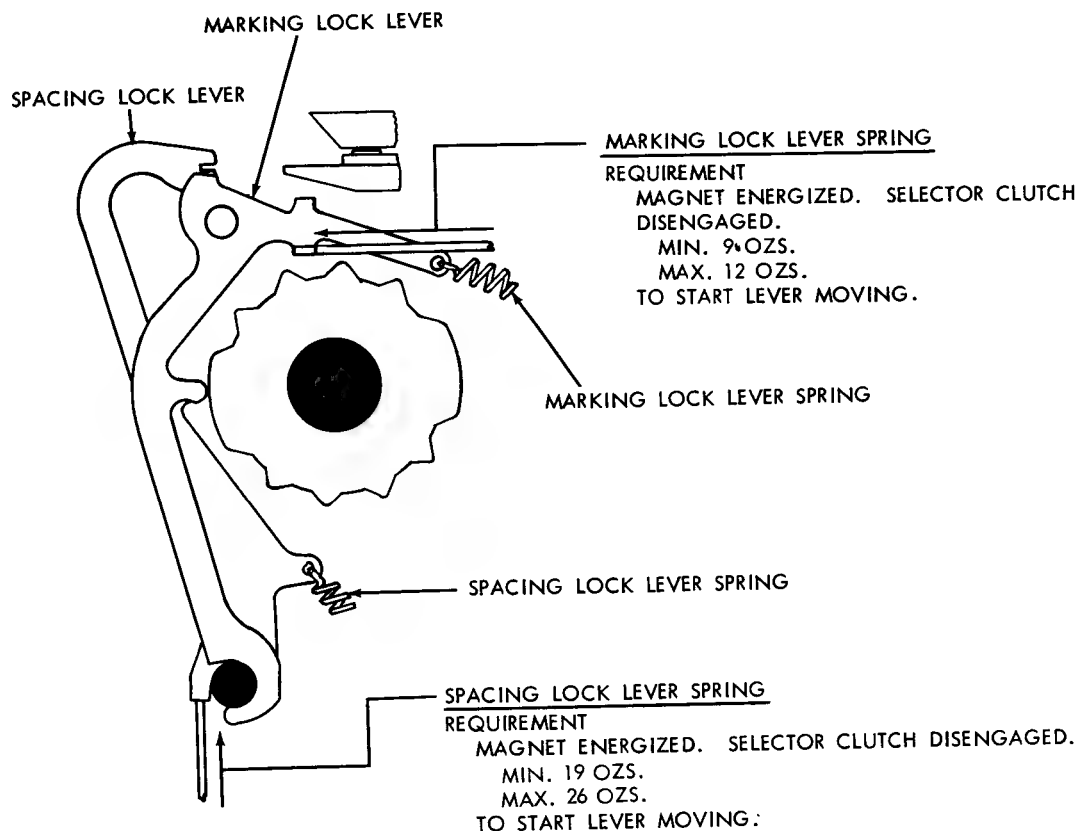


FIGURE 8. SELECTOR MECHANISM SPRINGS



SELECTOR ARMATURE SPRING

- (1) REQUIREMENT (WHEN NO DISTORTION TEST SET IS AVAILABLE)
MARKING LOCK LEVER, SPACING LOCK LEVER, AND START
LEVER ON HIGH PARTS OF THEIR CAMS.

MIN. 2 OZS.

MAX. 2-1/2 OZS.

TO PULL ARMATURE TO MARKING POSITION

- (2) REQUIREMENT (WITH DISTORTION
TEST SET)

SELECTOR SHOULD BE
RELATIVELY FREE OF
INTERNAL BIAS WHEN
CHECKED AS SPECIFIED
IN THE INSTRUCTIONS
FURNISHED WITH SET.

TO ADJUST
POSITION THE
ADJUSTING NUT.

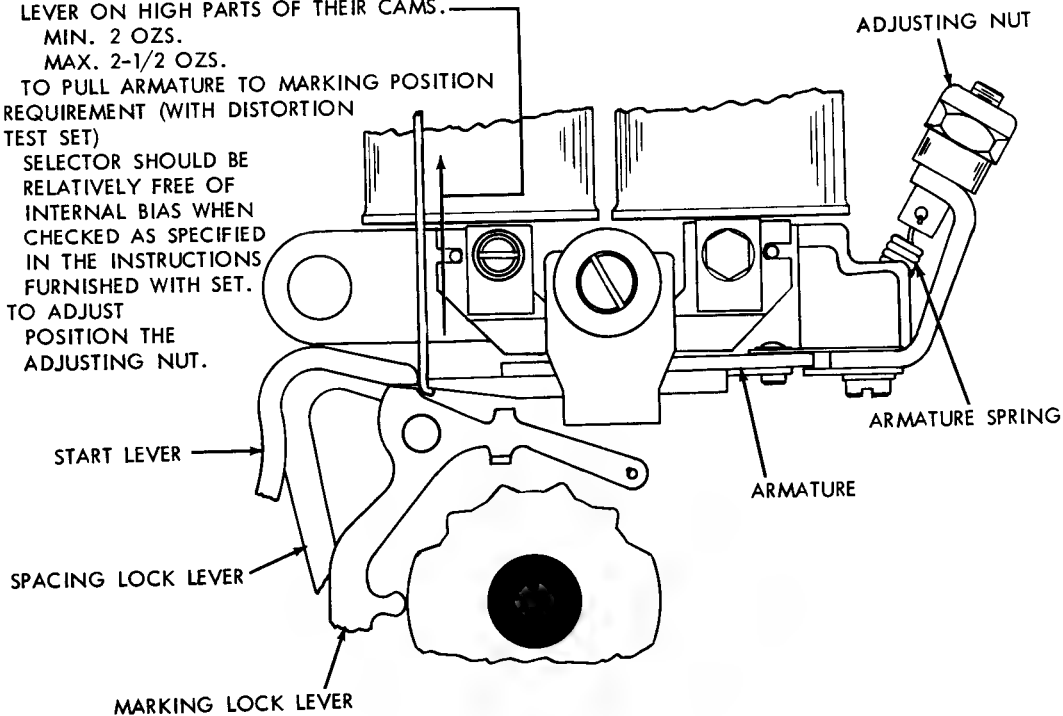


FIGURE 9. SELECTOR MECHANISM SPRINGS

THE ADJUSTMENTS ON PAGES 1-11 THROUGH 1-17 ARE APPLICABLE ONLY TO UNITS EQUIPPED WITH ONE CYCLE SELECTORS.

NOTE

TO FACILITATE MAKING THE FOLLOWING ADJUSTMENTS, REMOVE THE RANGE FINDER AND SELECTOR MAGNET ASSEMBLIES. TO INSURE BETTER OPERATION, PULL A PIECE OF KS BOND PAPER BETWEEN THE ARMATURE AND THE POLE PIECES TO REMOVE ANY OIL OR FOREIGN MATTER THAT MAY BE PRESENT. MAKE CERTAIN THAT NO LINT OR PIECES OF PAPER REMAIN BETWEEN THE POLE PIECES AND ARMATURE.

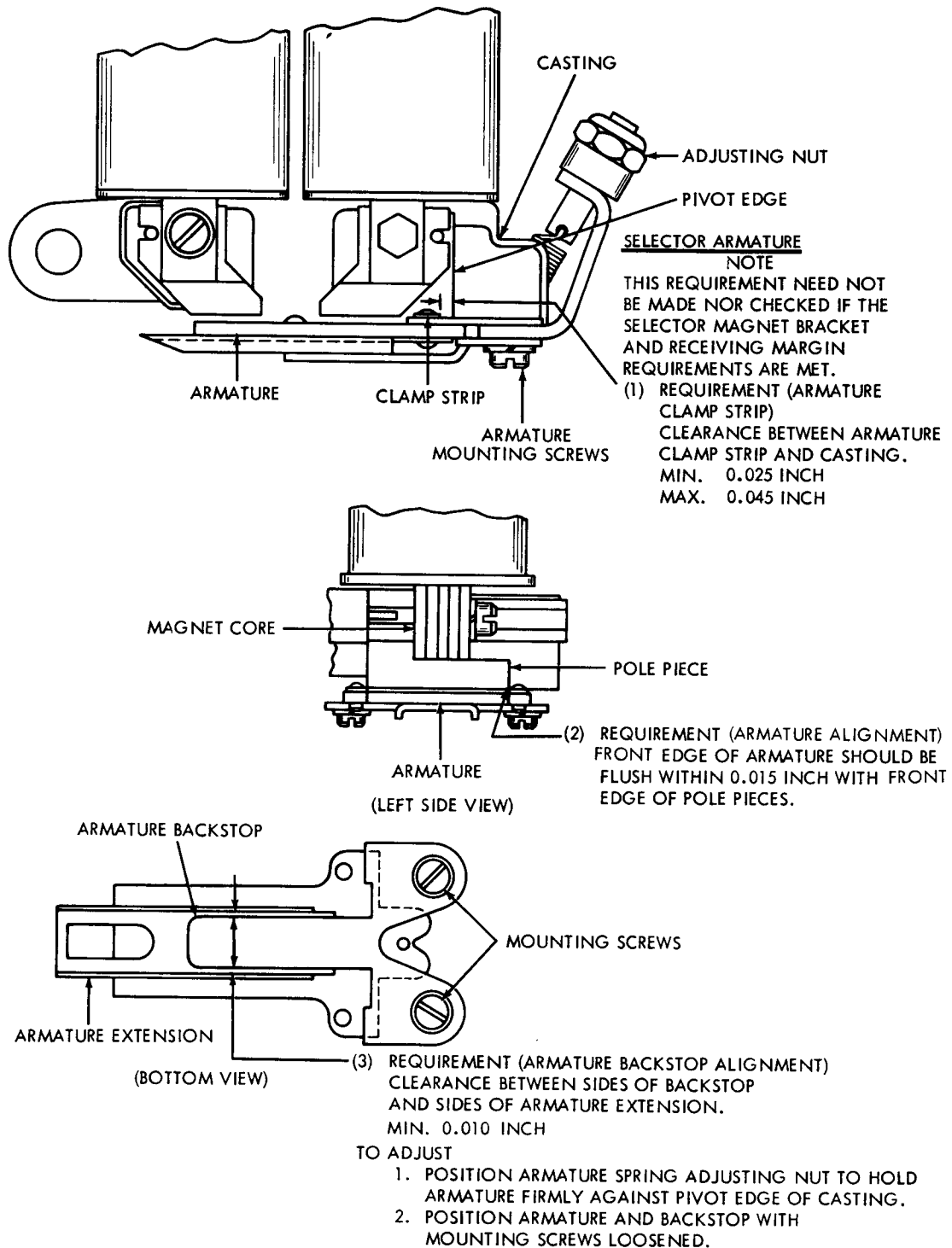
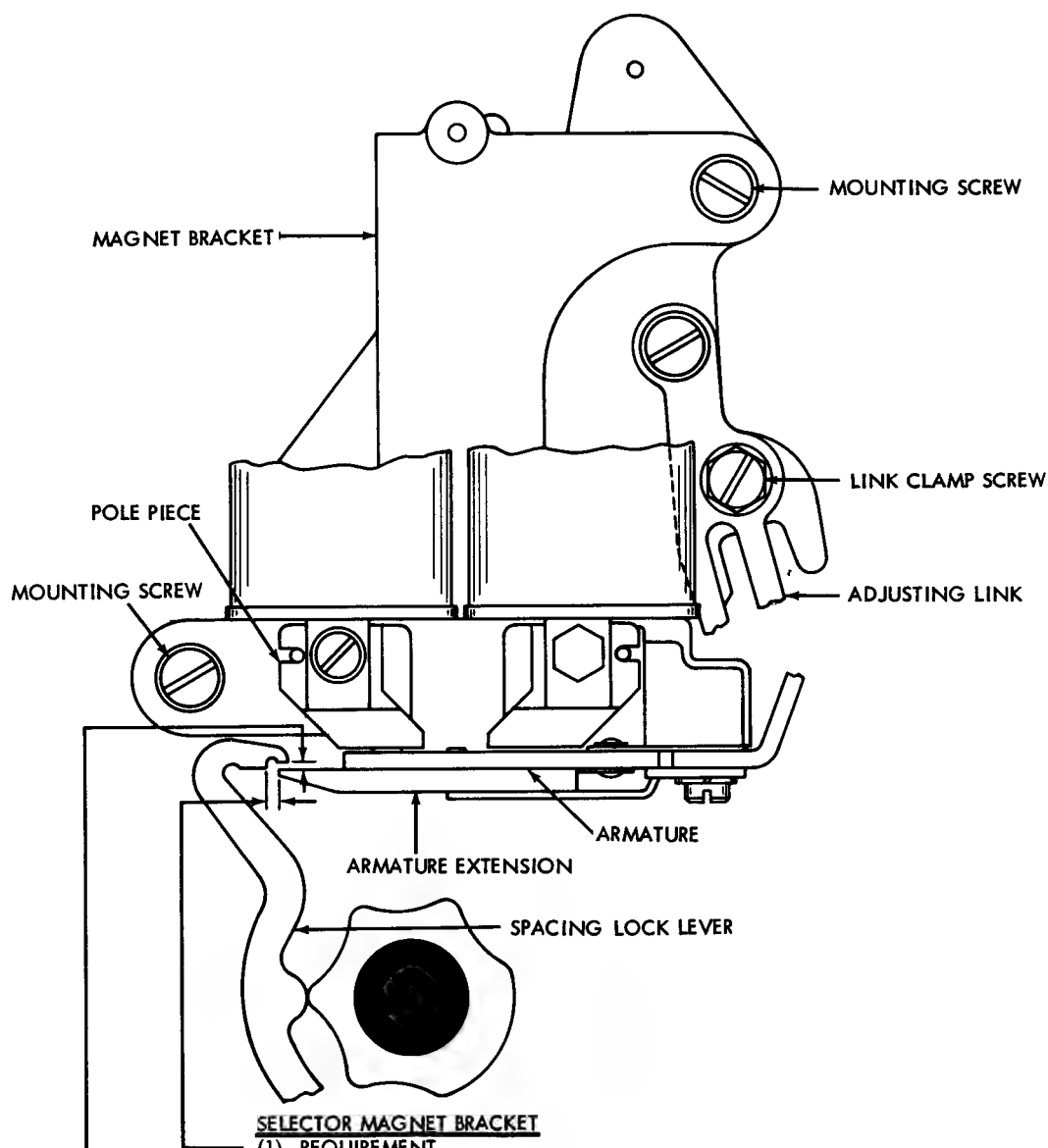


FIGURE 1G SELECTOR MAGNET AND ARMATURE MECHANISM



SELECTOR MAGNET BRACKET

(1) REQUIREMENT

SPACING LOCK LEVER ON HIGH PART OF CAM.
 ARMATURE IN CONTACT WITH POLE PIECE.
 CLEARANCE BETWEEN END OF ARMATURE EXTENSION
 AND SHOULDER ON SPACING LOCK LEVER.
 MIN. 0.020 INCH
 MAX. 0.035 INCH

TO ADJUST

LOOSEN TWO MAGNET BRACKET MOUNTING SCREWS
 AND ADJUSTING LINK CLAMP SCREW. POSITION
 MAGNET BRACKET BY MEANS OF ADJUSTING LINK
 AND TIGHTEN LINK CLAMP SCREW ONLY.

(2) REQUIREMENT

SPACING LOCK LEVER ON HIGH PART OF CAM. ARMATURE IN CONTACT
 WITH POLE PIECE. SOME CLEARANCE BETWEEN UPPER SURFACE OF ARMATURE
 EXTENSION AND LOWER SURFACE OF SPACING LOCK LEVER WHEN LOCK LEVER
 IS HELD DOWNWARD.
 MAX. 0.003 INCH

TO ADJUST

POSITION UPPER END OF MAGNET BRACKET. TIGHTEN TWO MAGNET
 BRACKET MOUNTING SCREWS. RECHECK REQUIREMENT (1).

FIGURE 11. SELECTOR MAGNET BRACKET

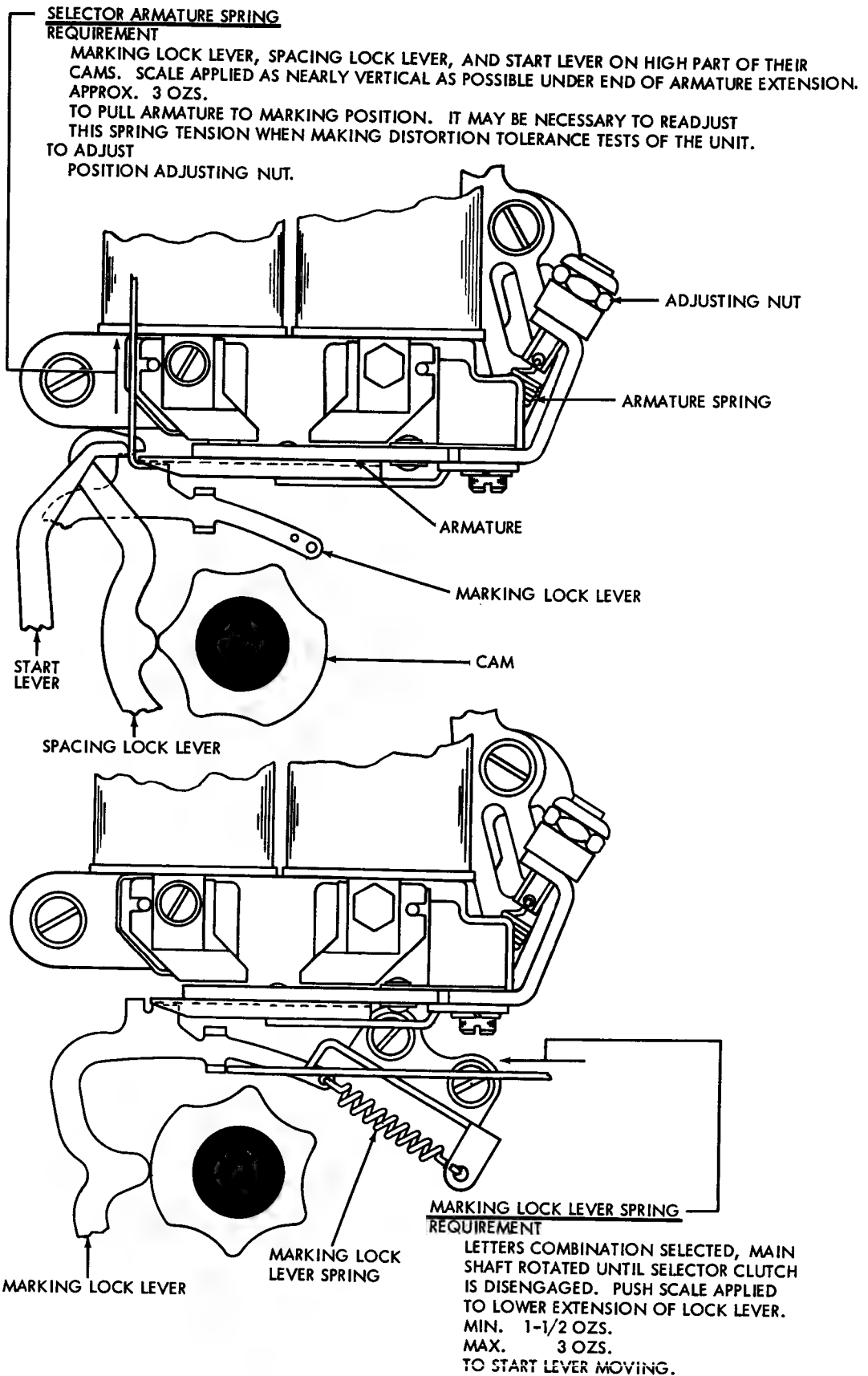


FIGURE 12. SELECTOR MECHANISM

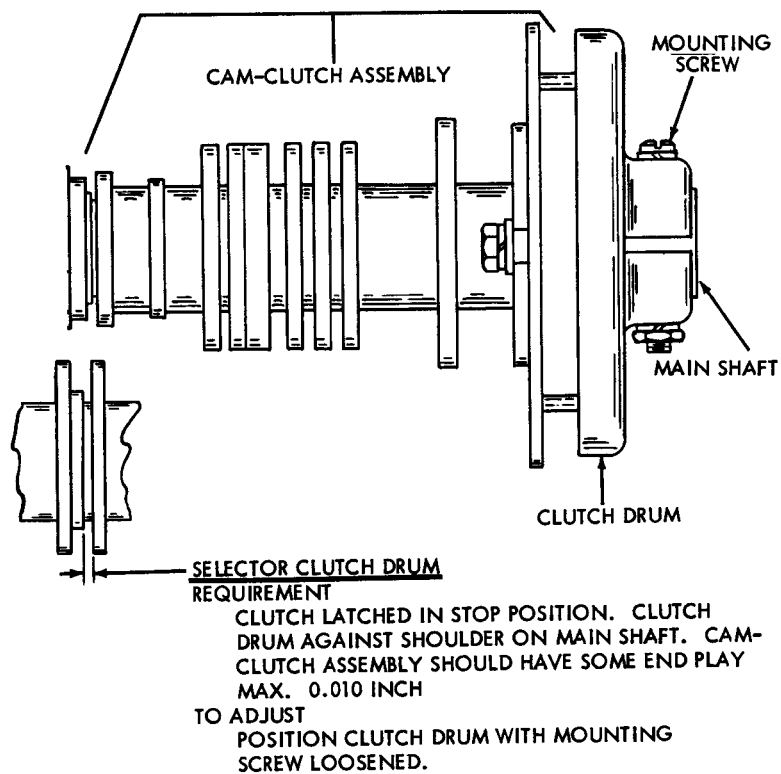
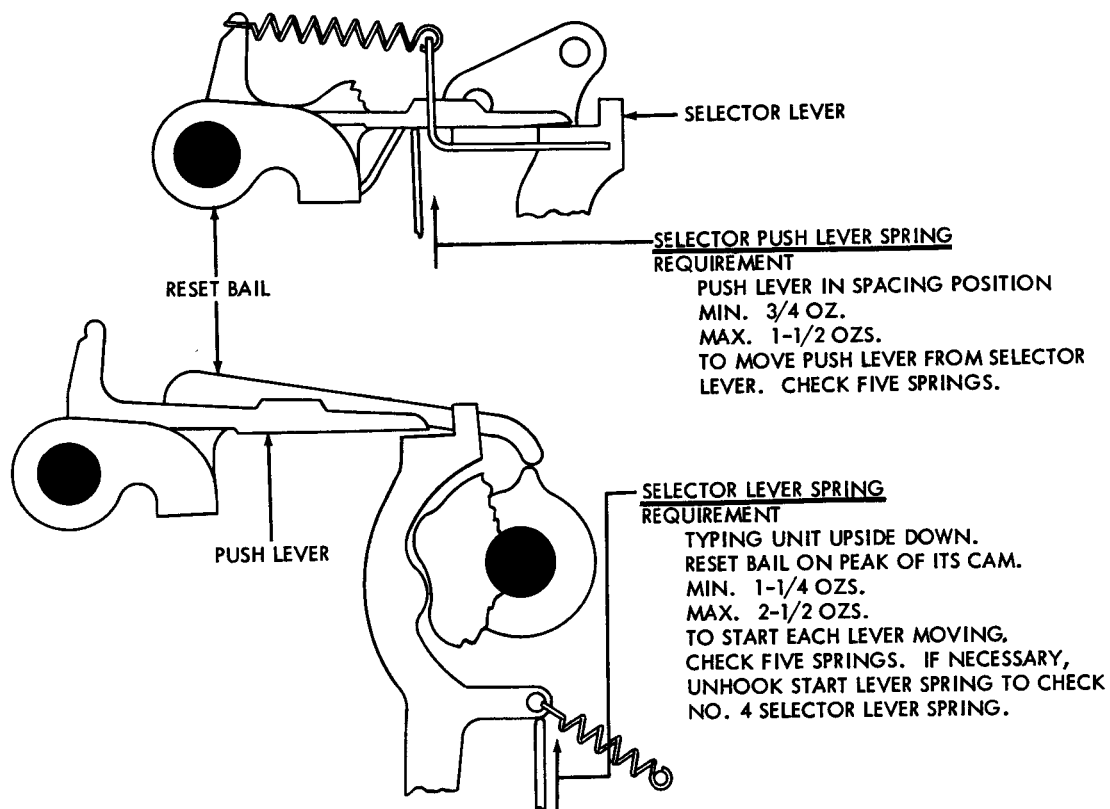


FIGURE 13. SELECTOR CAM CLUTCH

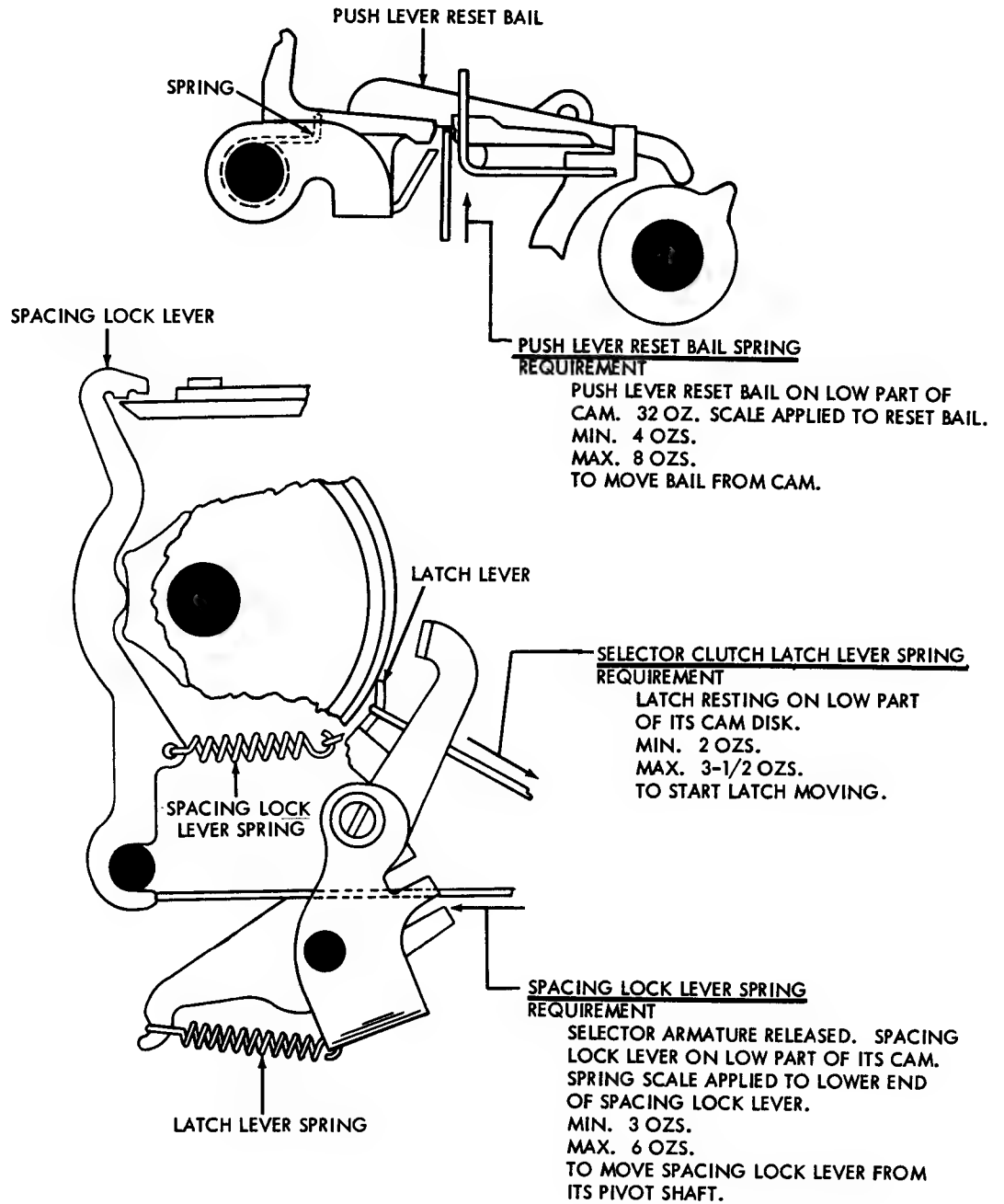


FIGURE 14. SELECTOR CLUTCH MECHANISM

NOTE: REPLACE RANGE FINDER AND SELECTOR MAGNET ASSEMBLY.

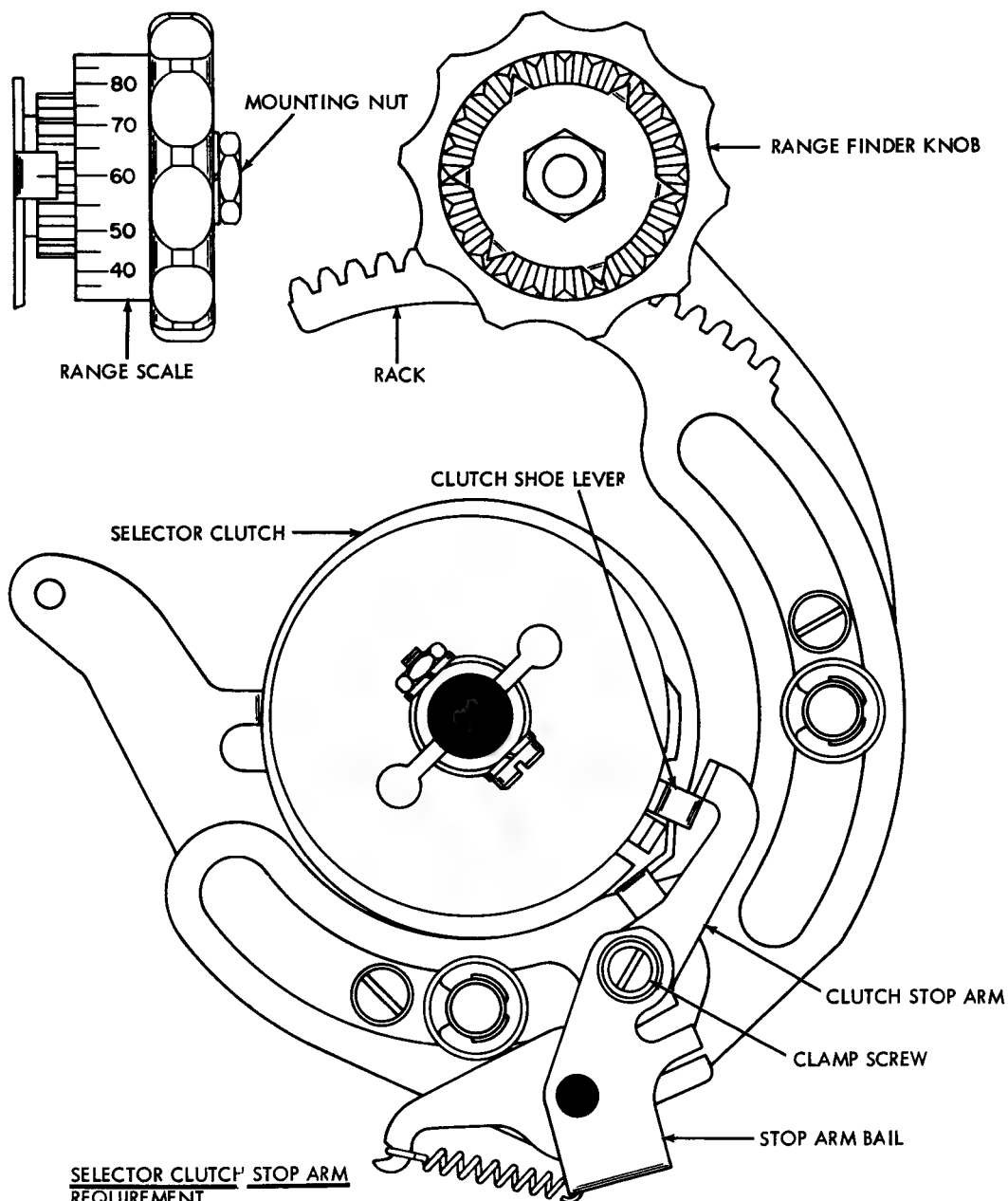
RANGE FINDER KNOB PHASING

REQUIREMENT

WITH RANGE FINDER KNOB TURNED TO EITHER END OF RACK, ZERO MARK ON SCALE SHOULD BE WITHIN 3 POINTS OF SCRIBED LINE ON RANGE FINDER PLATE.

TO ADJUST

REMOVE MOUNTING NUT, DISENGAGE KNOB FROM RACK AND POSITION KNOB. RE-ENGAGE KNOB WITH RACK AND REPLACE MOUNTING NUT.



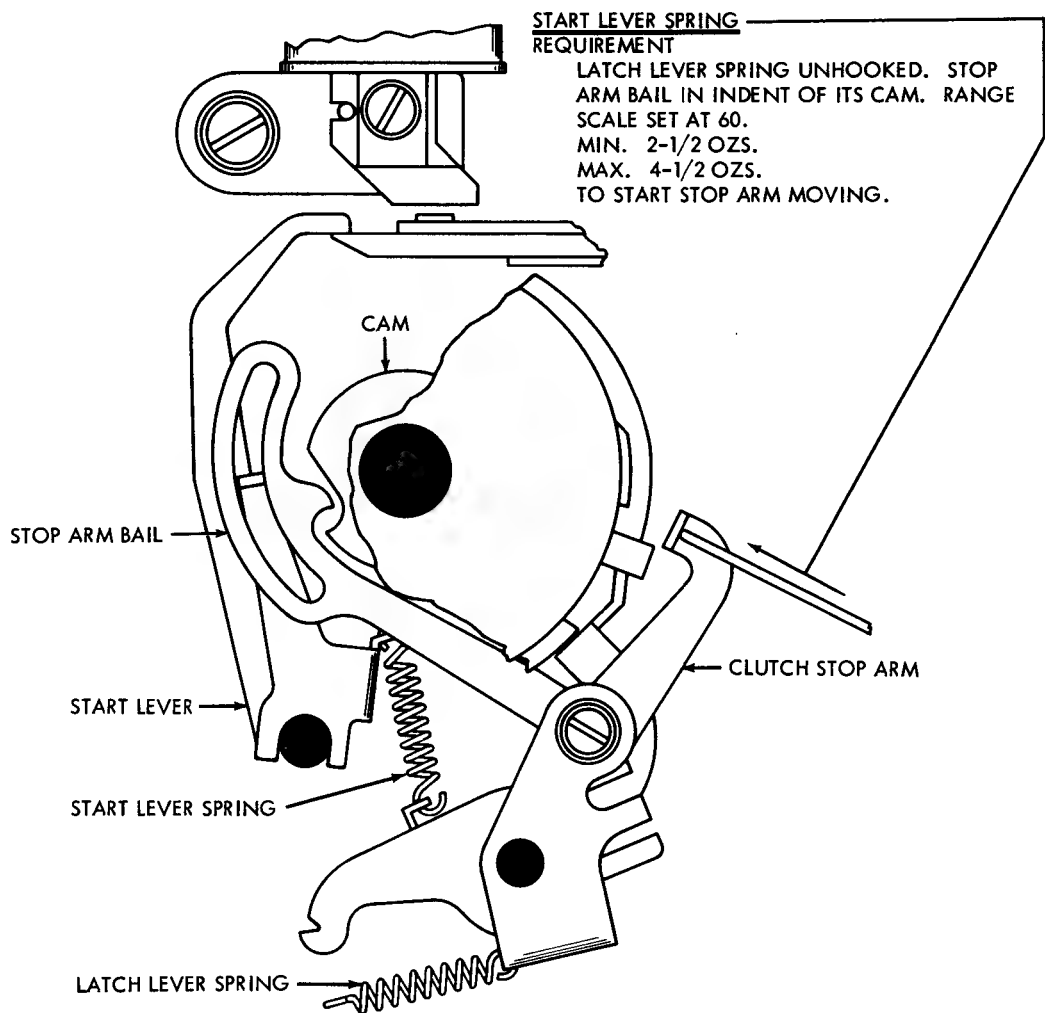
SELECTOR CLUTCH STOP ARM REQUIREMENT

RANGE SCALE SET AT 60. SELECTOR CLUTCH DISENGAGED. ARMATURE IN MARKING POSITION. CLUTCH STOP ARM SHOULD ENGAGE CLUTCH SHOE LEVER BY APPROXIMATELY FULL THICKNESS OF SHOE LEVER.

TO ADJUST

POSITION STOP ARM ON STOP ARM BAIL WITH CLAMP SCREW LOOSENED.

FIGURE 15. RANGE FINDER MECHANISM



SELECTOR RECEIVING MARGIN

WHEN A SIGNAL DISTORTION TEST SET IS USED FOR DETERMINING THE RECEIVING MARGINS OF THE SELECTOR, AND WHERE THE CONDITION OF THE COMPONENTS IS EQUIVALENT TO THAT OF NEW EQUIPMENT, THE RANGE AND DISTORTION TOLERANCES BELOW SHOULD BE MET.

SELECTOR RECEIVING MARGIN MINIMUM REQUIREMENTS

CURRENT	SPEED IN W.P.M.	POINTS RANGE WITH ZERO DISTORTION	PERCENTAGE OF MARK- ING AND SPACING BIAS TOLERATED	END DISTORTION TOLER- ATED WITH SCALE AT BIAS OPTIMUM SETTING
0.060 AMP. (WINDINGS PARALLEL)	60 75 100	72	40	35
0.020 AMP. (WINDINGS SERIES)	60 75	72	40	35

TO ADJUST: REFINE THE SELECTOR ARMATURE SPRING (FIGURE 12)

FIGURE 16. SELECTOR CLUTCH MECHANISM

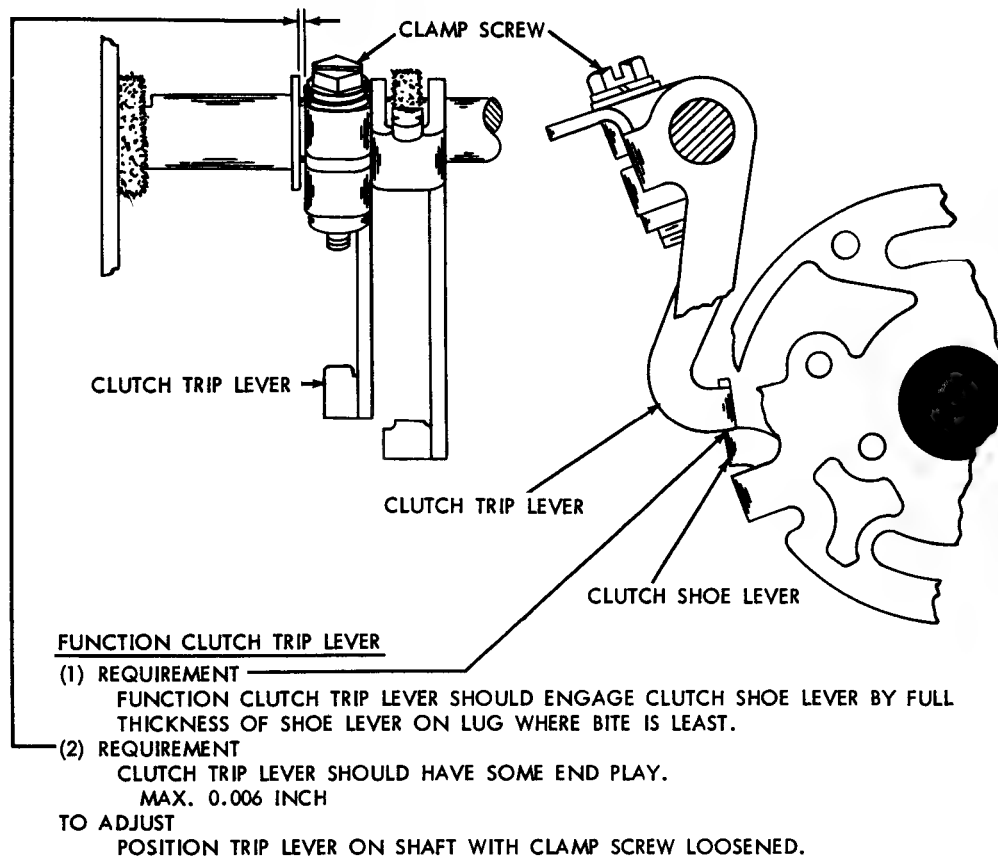
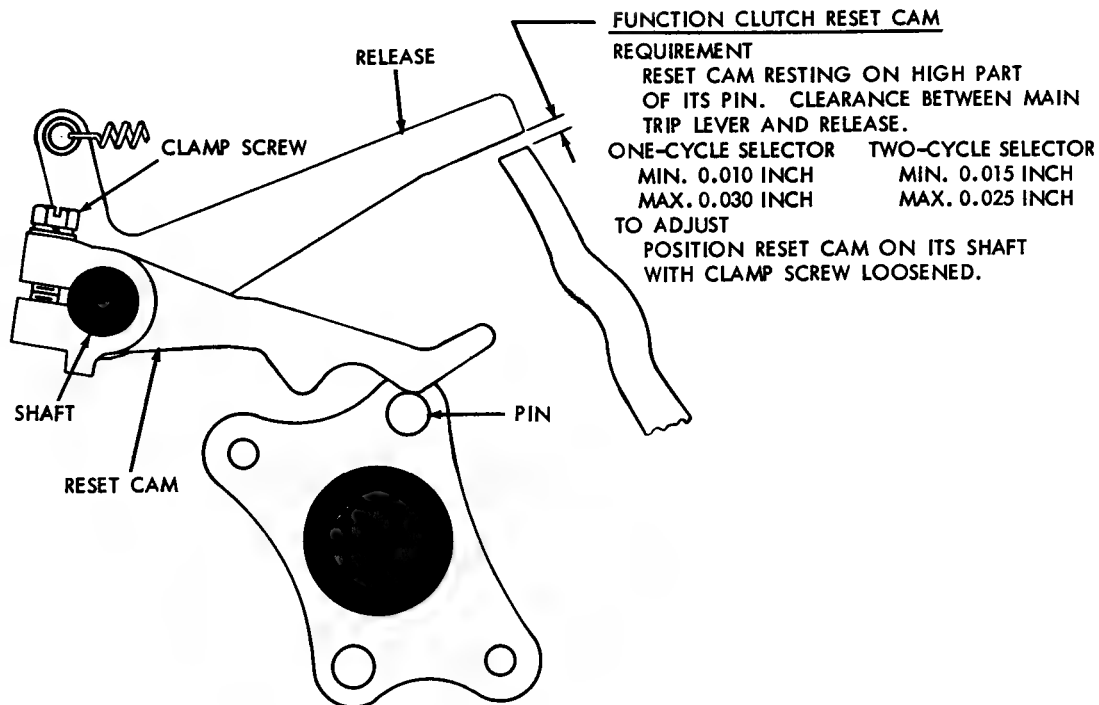
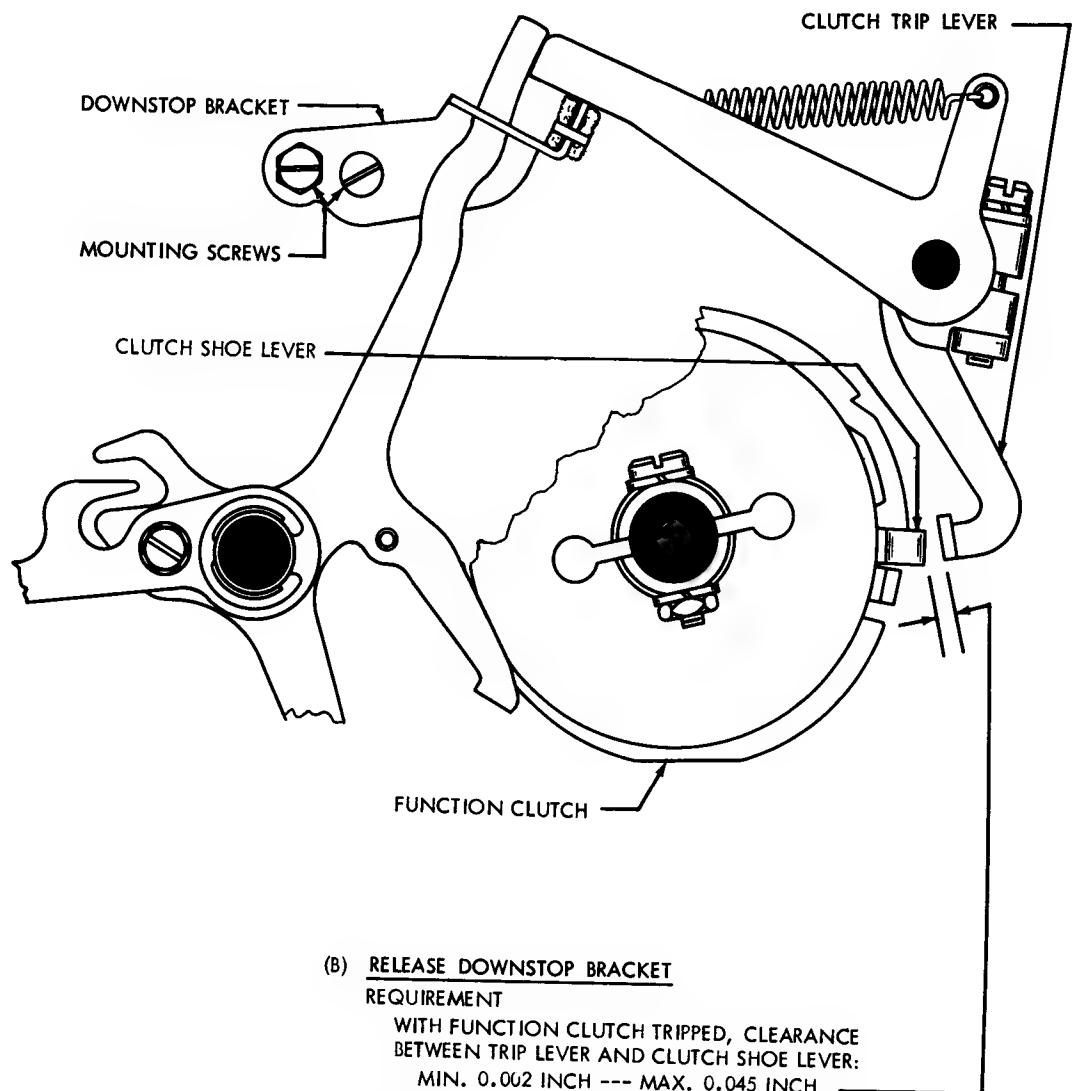


FIGURE 17. FUNCTION CLUTCH RESET CAM AND TRIP LEVER



(B) RELEASE DOWNSTOP BRACKET

REQUIREMENT

WITH FUNCTION CLUTCH TRIPPED, CLEARANCE
BETWEEN TRIP LEVER AND CLUTCH SHOE LEVER:

MIN. 0.002 INCH --- MAX. 0.045 INCH

AT POINT WHERE CLEARANCE IS LEAST.

(ON TWO-STOP CLUTCHES, USE STOP WHICH HAS
LEAST CLEARANCE)

TO ADJUST

REMOVE TAPE GUARD. POSITION DOWNSTOP BRACKET
WITH MOUNTING SCREWS FRICTION TIGHT.

FIGURE 18. FUNCTION MECHANISM

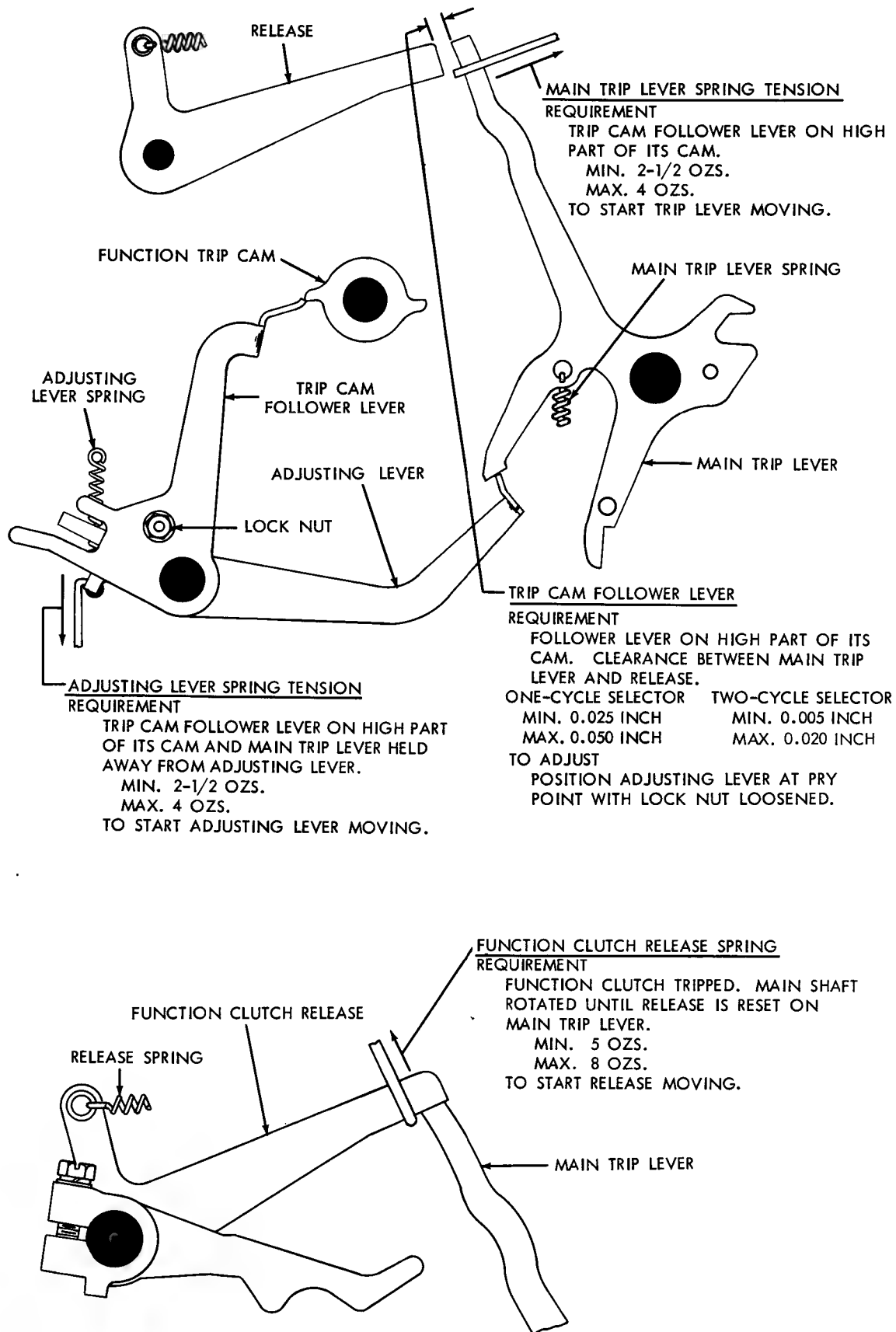


FIGURE 19. FUNCTION CLUTCH TRIP MECHANISM

ROCKER BAIL REQUIREMENT

WITH ROCKER BAIL POSITIONED TO ITS EXTREME LEFT AND UPPER ROLLER IN CONTACT WITH FUNCTION CAM:

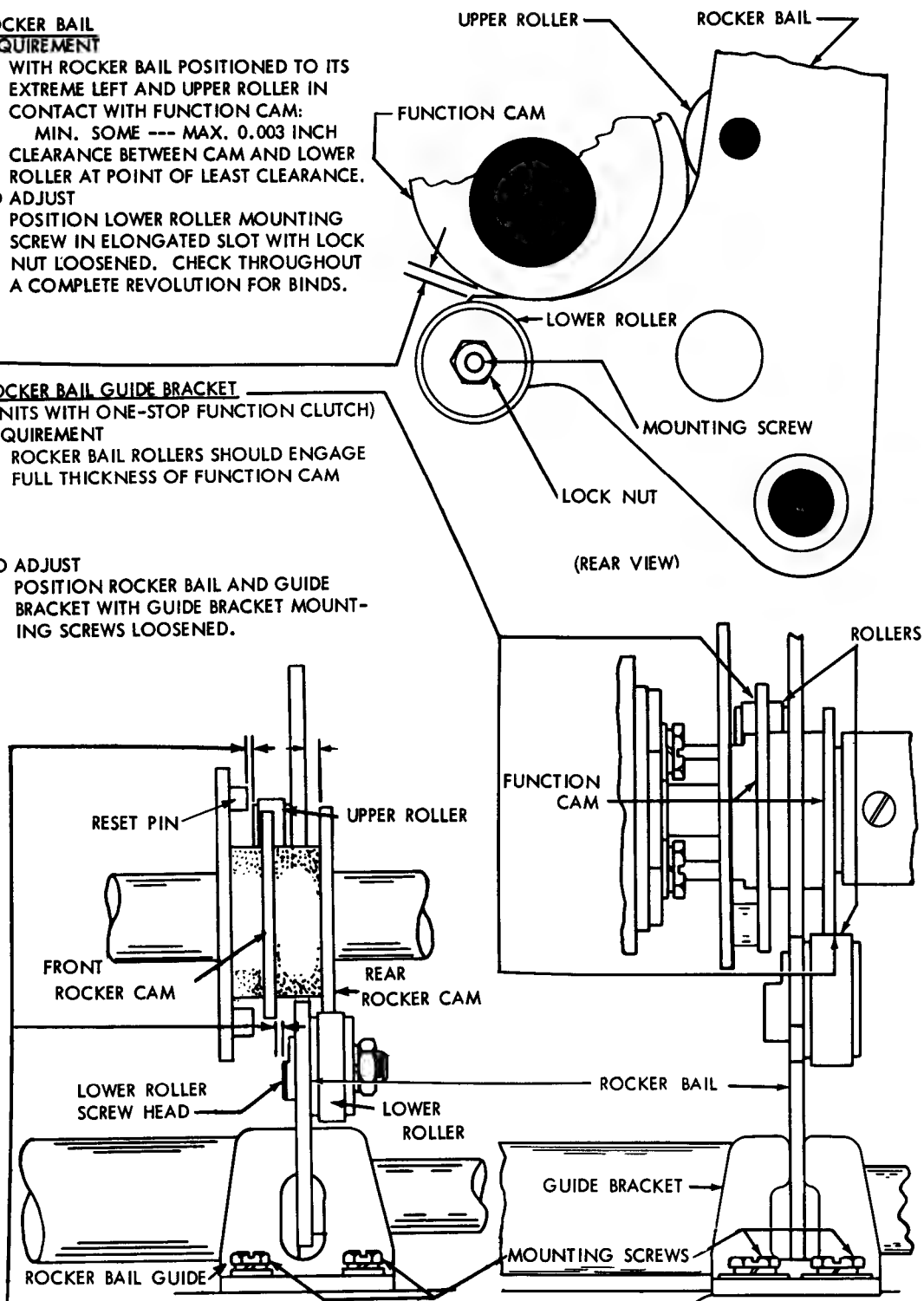
MIN. SOME --- MAX. 0.003 INCH CLEARANCE BETWEEN CAM AND LOWER ROLLER AT POINT OF LEAST CLEARANCE.

TO ADJUST POSITION LOWER ROLLER MOUNTING SCREW IN ELONGATED SLOT WITH LOCK NUT LOOSENED. CHECK THROUGHOUT A COMPLETE REVOLUTION FOR BINDS.

ROCKER BAIL GUIDE BRACKET (UNITS WITH ONE-STOP FUNCTION CLUTCH) REQUIREMENT

ROCKER BAIL ROLLERS SHOULD ENGAGE FULL THICKNESS OF FUNCTION CAM

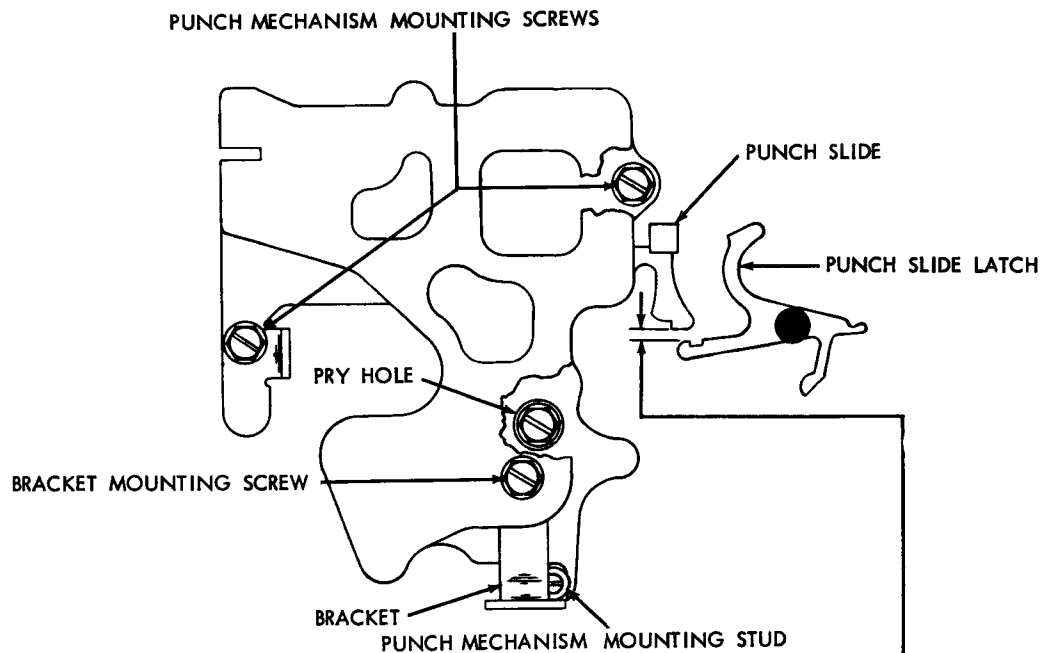
TO ADJUST POSITION ROCKER BAIL AND GUIDE BRACKET WITH GUIDE BRACKET MOUNTING SCREWS LOOSENED.

**ROCKER BAIL GUIDE BRACKET (UNITS WITH TWO-STOP FUNCTION CLUTCH) REQUIREMENT**

CLEARANCE BETWEEN UPPER ROLLER AND RESET PINS; BETWEEN LOWER ROLLER SCREW HEAD AND FRONT CAM; BETWEEN ROCKER BAIL AND REAR ROCKER CAM. MIN. 0.010 INCH

TO ADJUST POSITION ROCKER BAIL WITH GUIDE MOUNTING SCREWS LOOSENED.

FIGURE 20. ROCKER BAIL AND GUIDE BRACKET.



PUNCH MOUNTING POSITION-PRELIMINARY REQUIREMENT

PUNCH MOUNTING SCREWS AND MOUNTING STUD SHOULD BE CENTRALLY LOCATED IN THEIR ELONGATED MOUNTING SLOTS.

TO ADJUST

REMOVE MOUNTING STUD AND LOOSEN TWO PUNCH MECHANISM MOUNTING SCREWS AND BRACKET MOUNTING SCREW. POSITION PUNCH MECHANISM SO TAPPED HOLE OF FRAME IS CENTRALLY LOCATED IN LOWER ELONGATED SLOT OF PUNCH MECHANISM BACK-PLATE. TIGHTEN TWO PUNCH MECHANISM MOUNTING SCREWS. REPLACE AND TIGHTEN MOUNTING STUD. TIGHTEN BRACKET MOUNTING SCREW.

PUNCH MOUNTING POSITION - FINAL

NOTE

THIS ADJUSTMENT SHOULD BE MADE AFTER THE PUNCH SLIDE GUIDE POSITION ADJUSTMENT. FIGURE 23.

REQUIREMENT

LETTERS CODE COMBINATION SELECTED AND FUNCTION CLUTCH TRIPPED. CLEARANCE BETWEEN PUNCH SLIDE AND PUNCH SLIDE LATCH
 MIN. 0.020 INCH
 MAX. 0.030 INCH

TO ADJUST

LOOSEN PUNCH MECHANISM MOUNTING SCREWS, BRACKET MOUNTING SCREW, AND MOUNTING STUD. PLACE TIP OF SCREWDRIVER BETWEEN SCREW AND RIM OF PRY HOLE AND PRY PUNCH MECHANISM UP OR DOWN. TIGHTEN ALL SCREWS.

FIGURE 21. PUNCH MOUNTING

NOTE
BEFORE PROCEEDING WITH THE PUNCH UNIT ADJUSTMENTS, CHECK THE ROCKER BAIL ROLLER ADJUSTMENT.

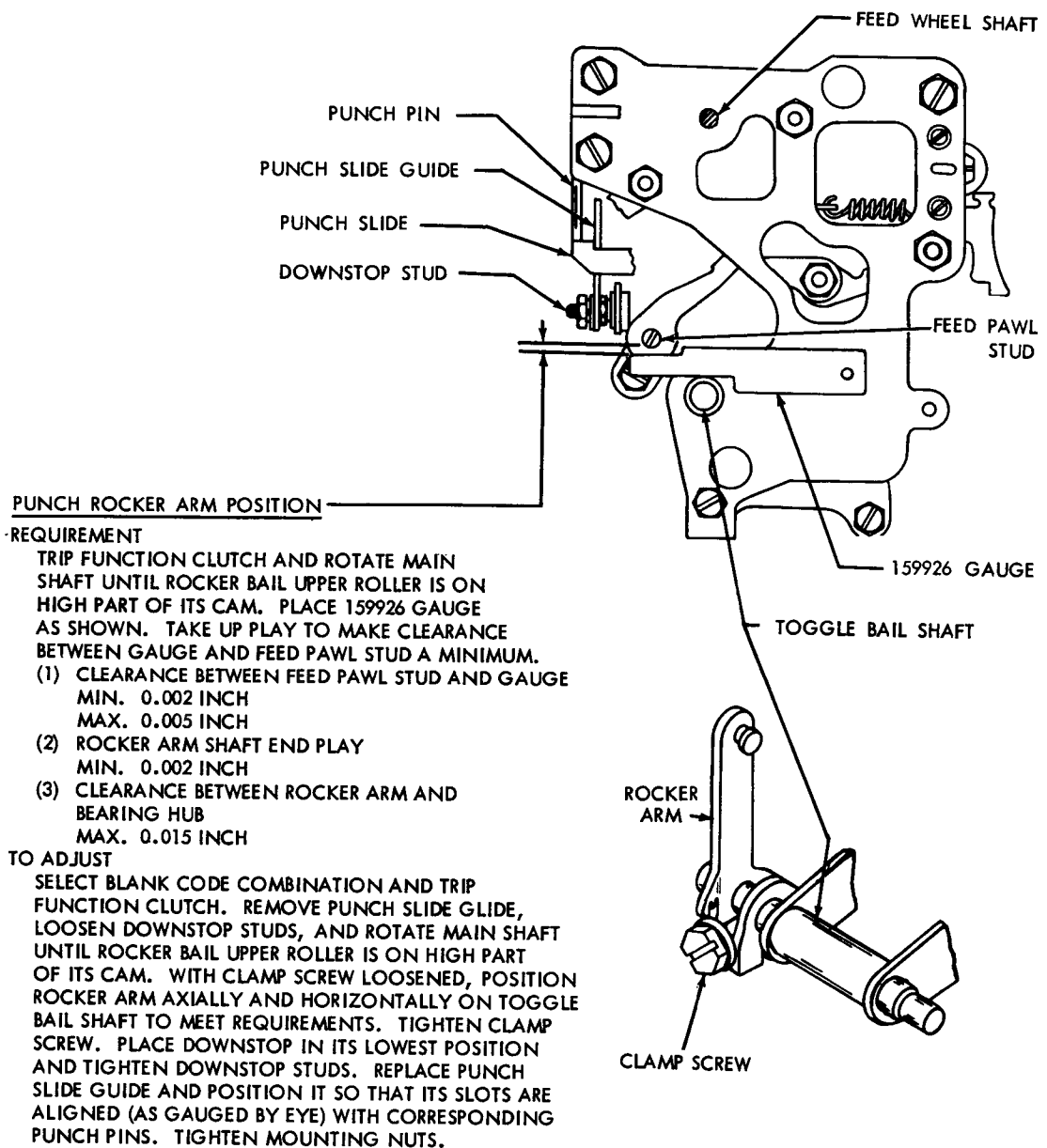


FIGURE 22. PUNCH ROCKER ARM

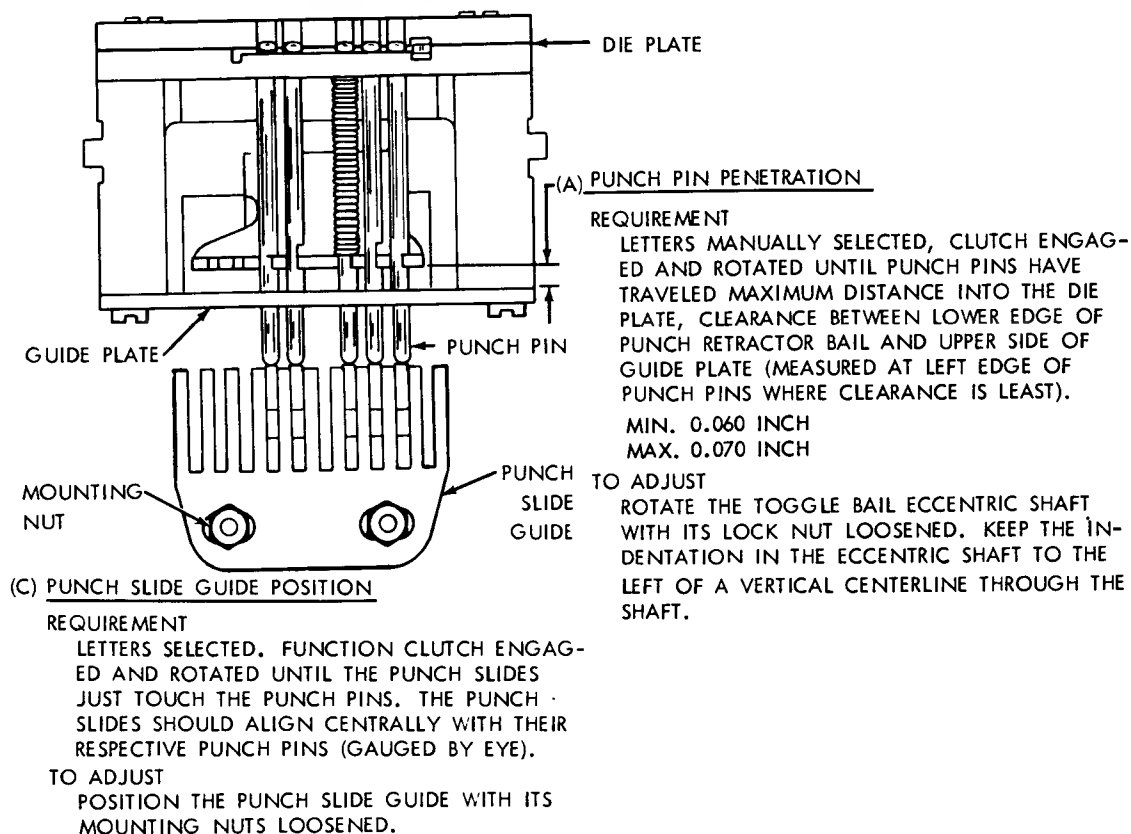
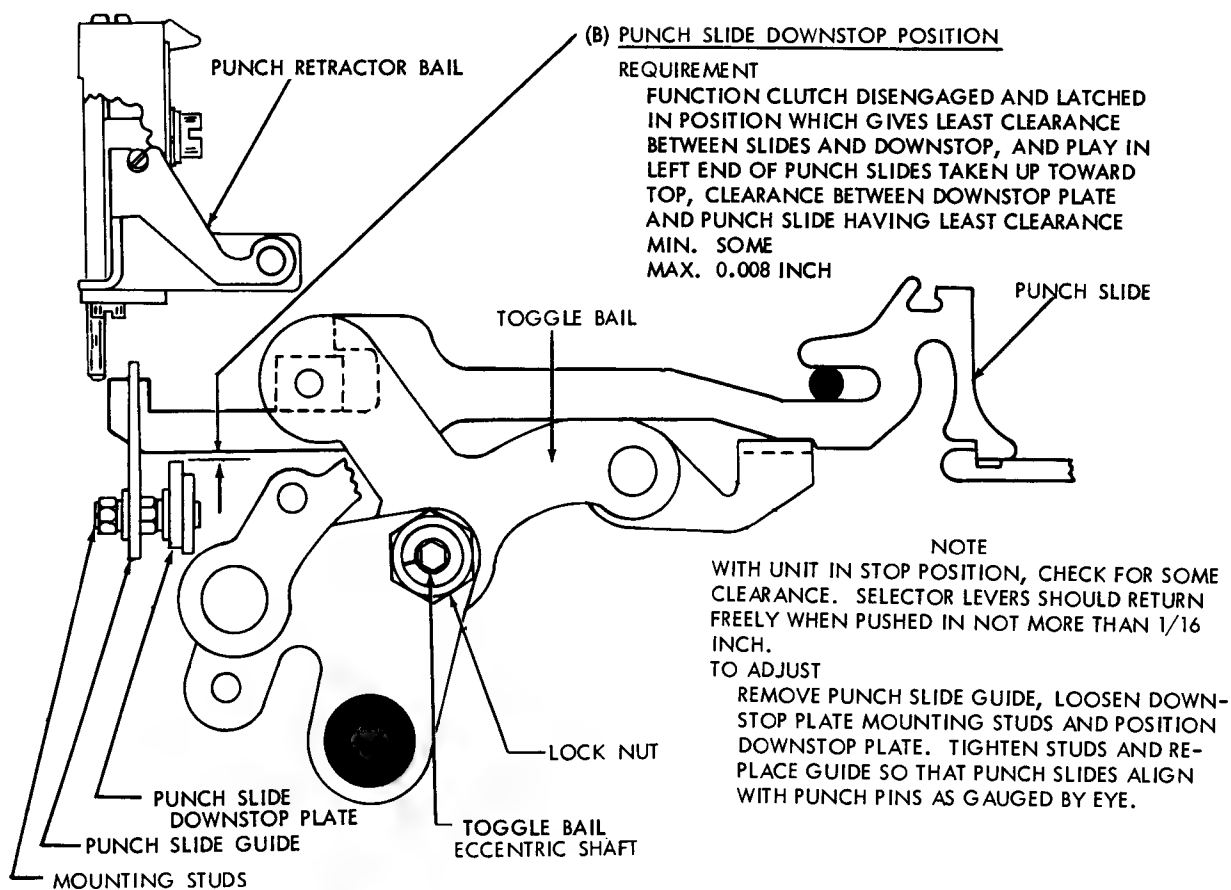


FIGURE 23. PUNCH SLIDE AND PUNCH PINS

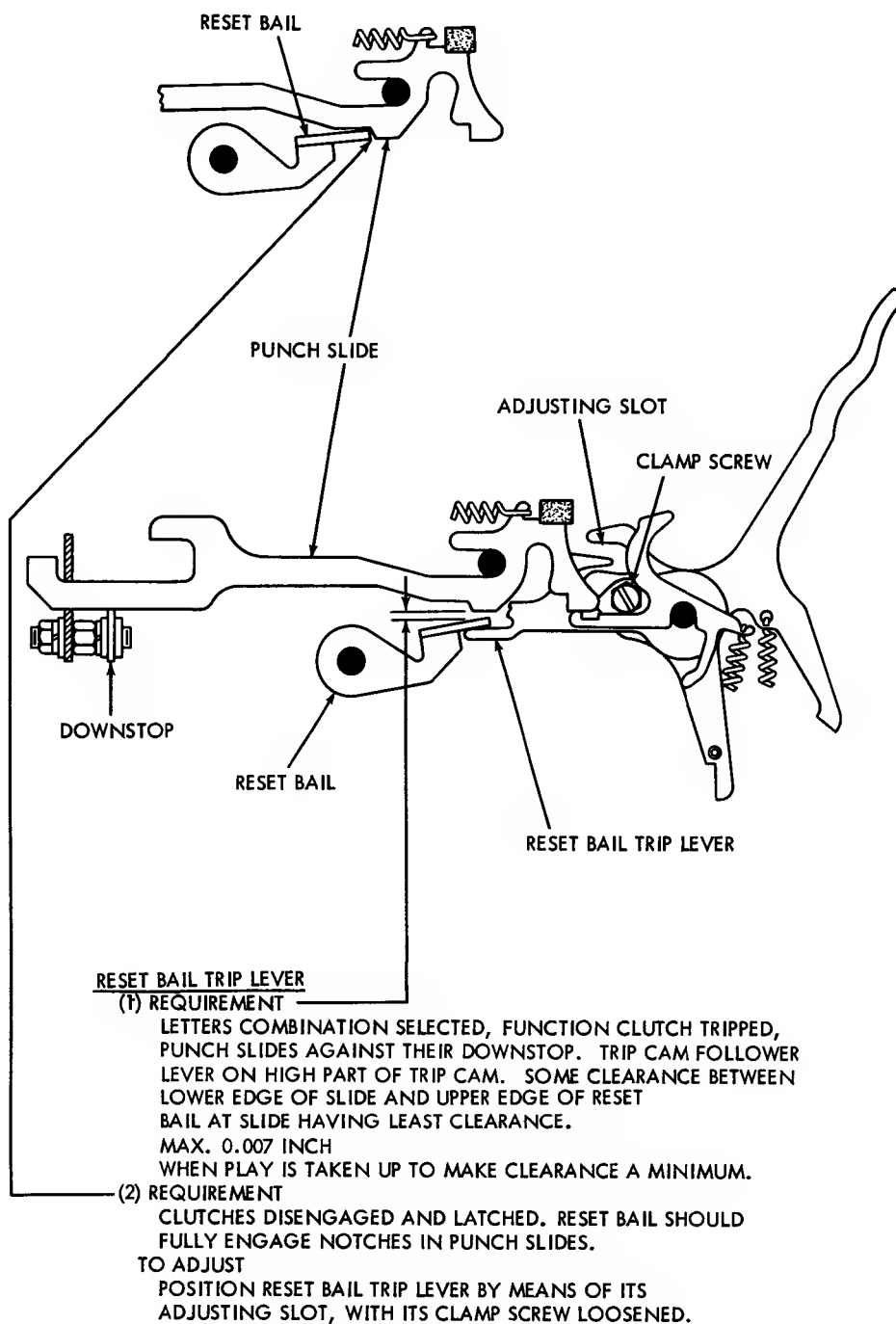
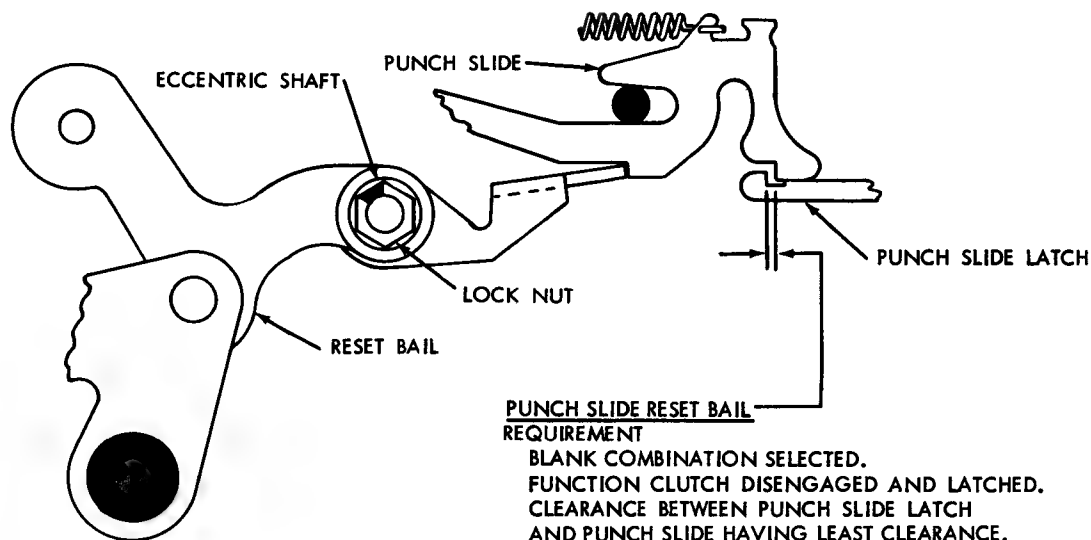


FIGURE 24. PUNCH MECHANISM RESET BAIL

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**PUNCH SLIDE RESET BAIL
REQUIREMENT**

BLANK COMBINATION SELECTED.
FUNCTION CLUTCH DISENGAGED AND LATCHED.
CLEARANCE BETWEEN PUNCH SLIDE LATCH
AND PUNCH SLIDE HAVING LEAST CLEARANCE.

MIN. 0.015 INCH

MAX. 0.025 INCH

TO ADJUST

ROTATE RESET BAIL ECCENTRIC SHAFT WITH ITS
LOCK NUT LOOSENED. KEEP INDENTATION IN
SHAFT ABOVE CENTERLINE THROUGH SHAFT.

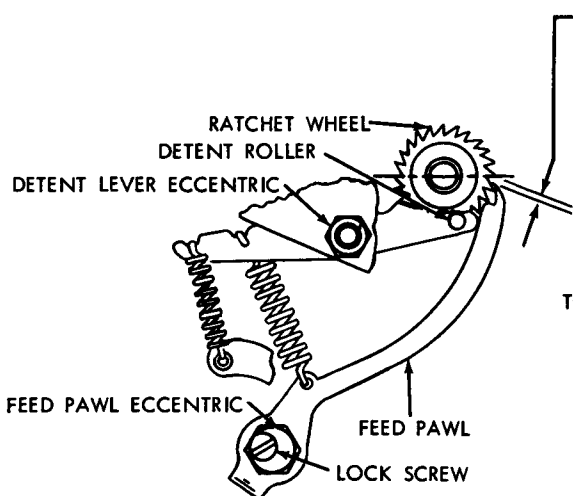
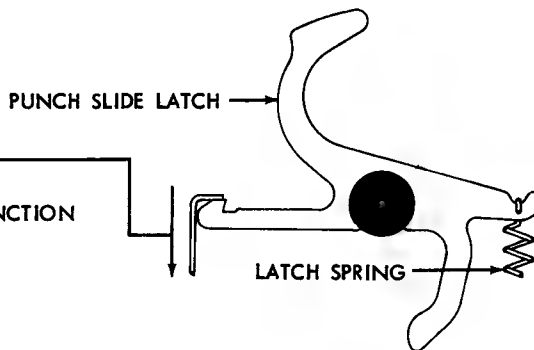
**PUNCH SLIDE LATCH SPRING TENSION
REQUIREMENT**

MAGNET ENERGIZED. SELECTOR AND FUNCTION
CLUTCH DISENGAGED AND LATCHED.

MIN. 3/4 OZS.

MAX. 1-3/4 OZS.

TO START EACH LEVER MOVING.



**FEED PAWL
REQUIREMENT**

FUNCTION CLUTCH DISENGAGED, INDENTATION
IN DETENT LEVER ECCENTRIC AT RIGHT ANGLE
TO LEVER, DETENT ROLLER IN CONTACT WITH
RATCHET WHEEL, HIGH PART OF FEED PAWL
ECCENTRIC TO THE RIGHT OF ITS LOCK SCREW,
THE FEED PAWL SHOULD ENGAGE THE FIRST
TOOTH BELOW A HORIZONTAL CENTERLINE
THROUGH THE RATCHET WHEEL WITH NO
PERCEPTIBLE CLEARANCE.

TO ADJUST

ROTATE THE FEED PAWL ECCENTRIC WITH
LOCK NUT LOOSENED.

NOTE

THIS ADJUSTMENT IS RELATED TO FEED HOLE
SPACING AND THE TWO ADJUSTMENTS MUST
BE MADE AT THE SAME TIME.

FIGURE 25. PUNCH UNIT RESET AND FEEDING MECHANISM

FEED HOLE SPACING (PRELIMINARY)**REQUIREMENT**

INDENT OF DIE WHEEL ECCENTRIC STUD POINTING DOWNWARD.

TO ADJUST

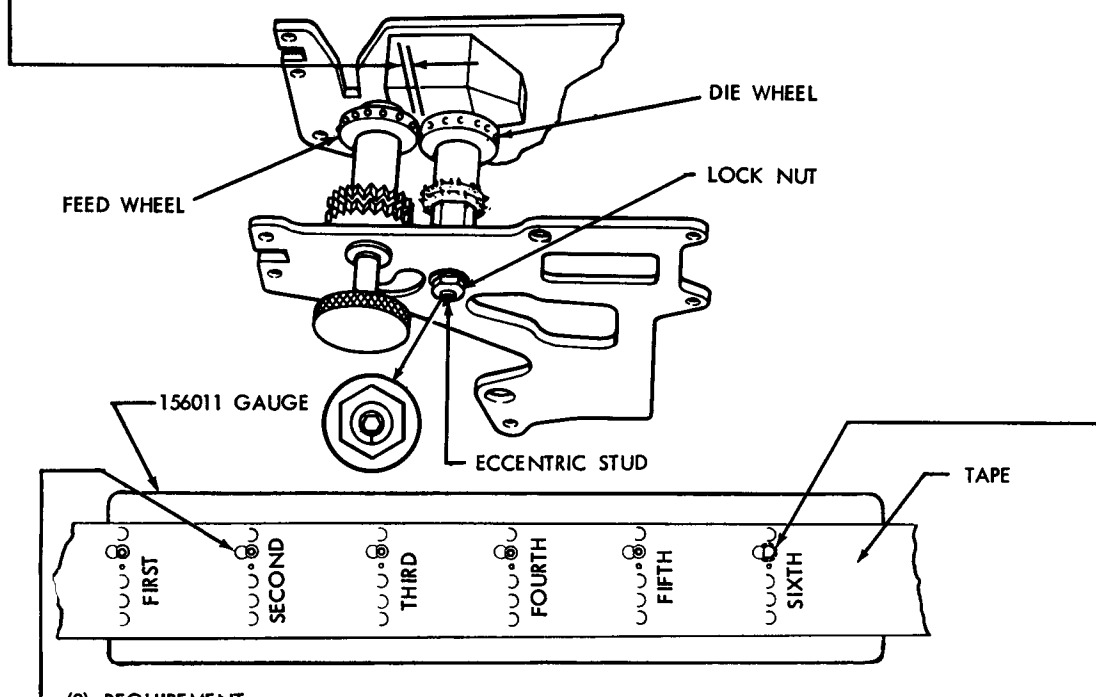
POSITION DIE WHEEL ECCENTRIC STUD WITH LOCK NUT LOOSENEED.

NOTE:

BEFORE PROCEEDING WITH THE FOLLOWING ADJUSTMENTS, CHECK BOTH TAPE GUIDE SPRING TENSIONS (FIGURE 22).

FEED HOLE SPACING (FINAL)**(1) REQUIREMENT**

WITH TAPE SHOE BLOCKED AWAY FROM FEED WHEEL, FEED PAWL AND DETENT DISENGAGED, AND TAPE REMOVED, FEED WHEEL SHOULD ROTATE FREELY. CHECK THROUGH 3 OR 4 REVOLUTIONS OF FEED WHEEL.

**(2) REQUIREMENT**

PERFORATE IN ORDER SIX SEQUENCES MADE UP OF NINE BLANK CODE COMBINATIONS FOLLOWED BY A LETTERS COMBINATION. OPEN CHADS SO CODE HOLES ARE VISIBLE. PLACE TAPE OVER SMOOTH SIDE OF 156011 TAPE GAUGE SO FIRST NO. 2 CODE HOLE IS CONCENTRIC WITH FIRST 0.072-INCH HOLE IN GAUGE (SEE NOTE BELOW). SECOND THROUGH FIFTH HOLES IN GAUGE SHOULD BE VISIBLE THROUGH NO. 2 CODE HOLES IN TAPE. CIRCULAR PORTION OF SIXTH NO. 2 CODE HOLE SHOULD BE ENTIRELY WITHIN 0.086-INCH HOLE IN GAUGE.

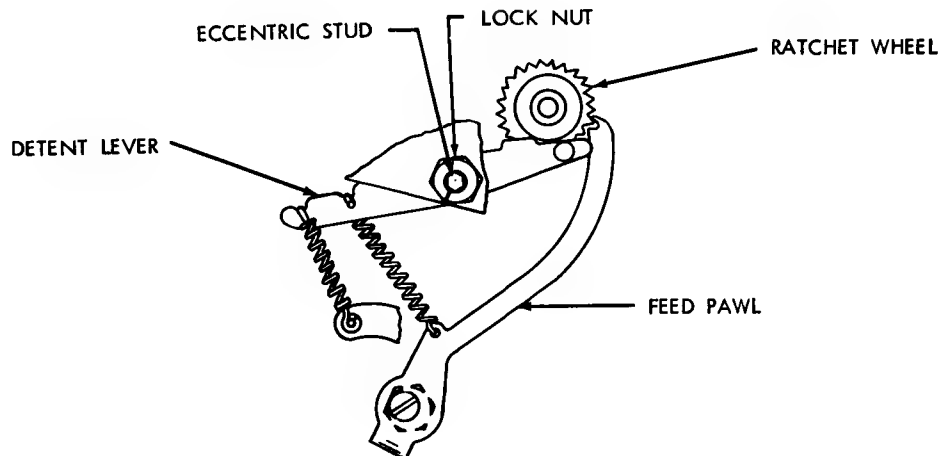
TO ADJUST

- (A) WITH TAPE REMOVED, POSITION DIE WHEEL ECCENTRIC STUD (INDENT KEPT BELOW CENTER OF STUD) WITH LOCK NUT LOOSENEED SO DIE WHEEL JUST BINDS ON FEED WHEEL. BACK OFF ECCENTRIC SO DIE WHEEL IS JUST FREE (CHECK THROUGH 3 REVOLUTIONS).
- (B) REFINE ABOVE ADJUSTMENT TO MEET REQUIREMENT (2). MOVE INDENT IN ECCENTRIC STUD TOWARD FEED WHEEL TO DECREASE SPACING AND AWAY FROM FEED WHEEL TO INCREASE SPACING. CAUTION: WITH TAPE REMOVED, MAKE SURE FEED WHEEL AND DIE WHEEL DO NOT BIND. RECHECK REQUIREMENT (1). IF NECESSARY, REFINE.

NOTE:

FIRST THROUGH FIFTH HOLES IN GAUGE ARE SAME SIZE AS CODE HOLES IN TAPE (0.072 INCH DIAMETER). SIXTH HOLE IN GAUGE IS LARGER (0.086 INCH). THIS ARRANGEMENT ALLOWS ± 0.007 INCH VARIATION IN 5 INCHES.

FIGURE 26. TAPE FEED MECHANISM



DETENT

REQUIREMENT

A PIECE OF TAPE CONTAINING NINE FEED HOLES FOLLOWED BY A LETTERS COMBINATION PERFORATED ON THE REPERFORATOR MUST CONFORM TO THE 156011 TAPE GAUGE.

THE LATERAL CENTERLINE THROUGH THE CODE HOLES IN THE TAPE SHOULD COINCIDE WITH A LATERAL CENTERLINE THROUGH THE HOLES IN THE GAUGE.

TO ADJUST

ROTATE THE DETENT ECCENTRIC CLOCKWISE TO MOVE THE FEED HOLES TOWARD THE HINGED EDGE OF THE CODE HOLES AND COUNTERCLOCKWISE TO MOVE THE FEED HOLES TOWARD THE TRAILING EDGE OF THE CODE HOLES. TIGHTEN THE ECCENTRIC LOCK NUT AND RE-FINE THE FEED PAWL ADJUSTMENT.

RECHECK FEED PAWL ADJUSTMENT

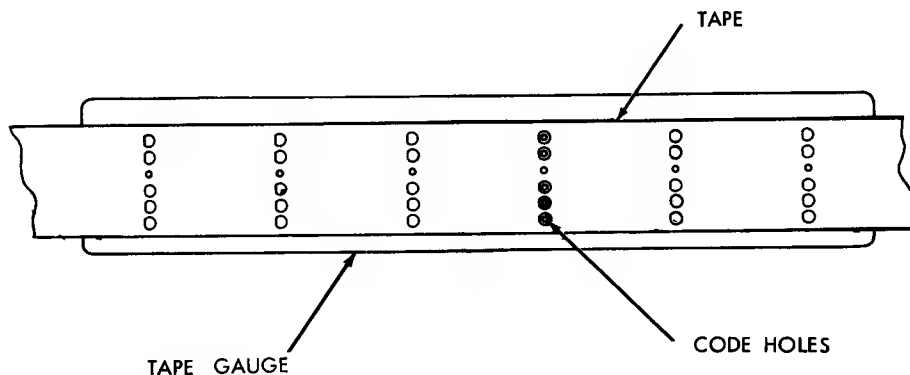
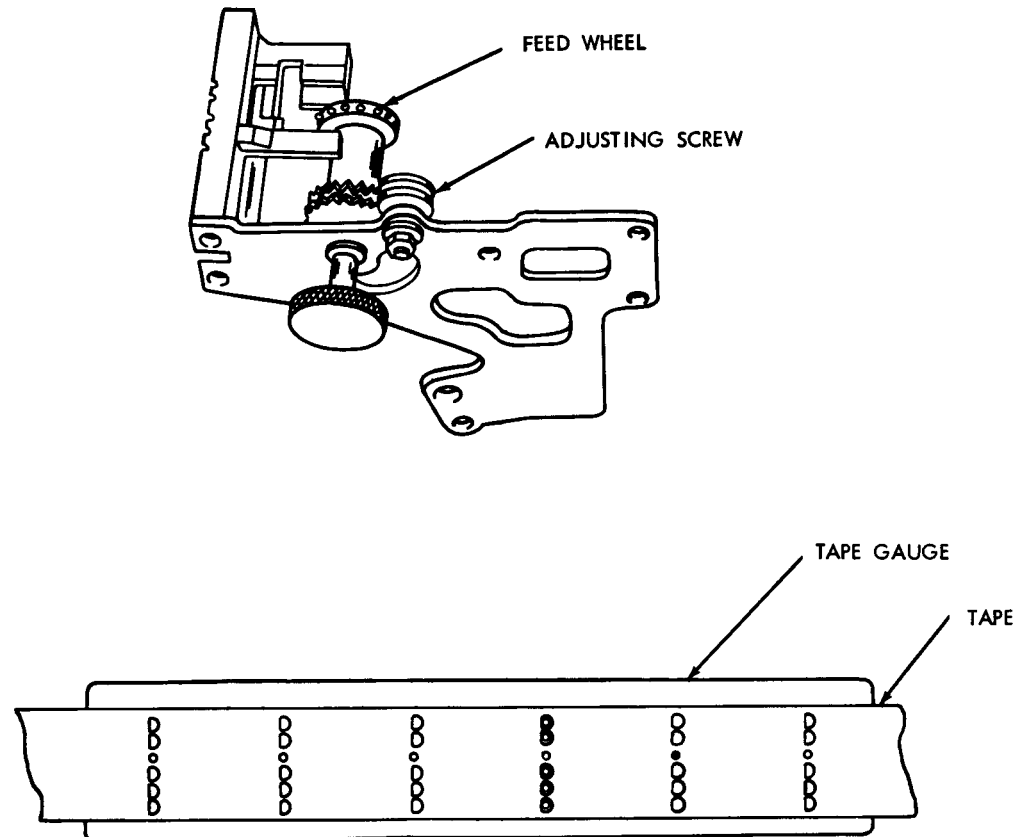


FIGURE 27. PUNCH DETENT



FEED HOLE LATERAL ALIGNMENT

REQUIREMENT

WHEN A PIECE OF TAPE CONTAINING NINE FEED HOLES FOLLOWED BY A LETTERS COMBINATION ARE PERFORATED BY THE REPERFORATOR AND CHECKED BY THE TAPE GAUGE, THE CODE HOLES IN THE TAPE SHOULD BE

CONCENTRIC WITH THE HOLES IN THE GAUGE

TO ADJUST

TURN THE FEED WHEEL ADJUSTING SCREW IN OR OUT WITH ITS LOCK NUT LOOSENED.

REFINE DETENT ADJUSTMENT IF NECESSARY.

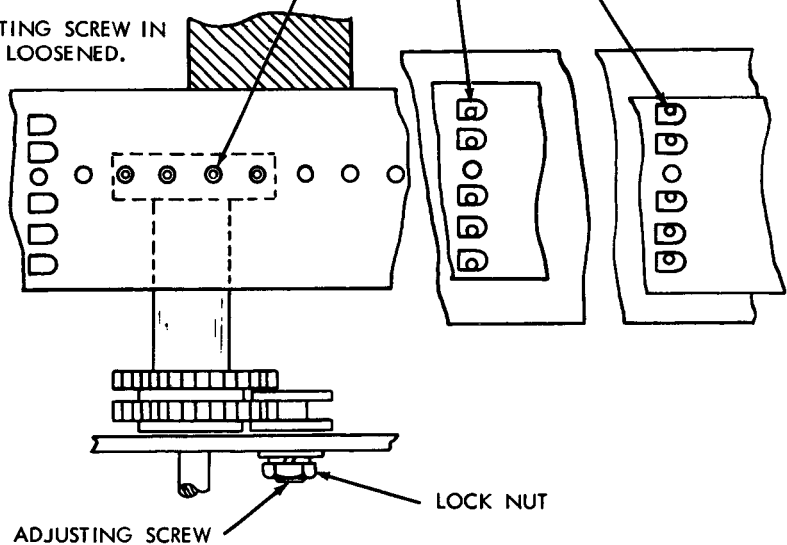
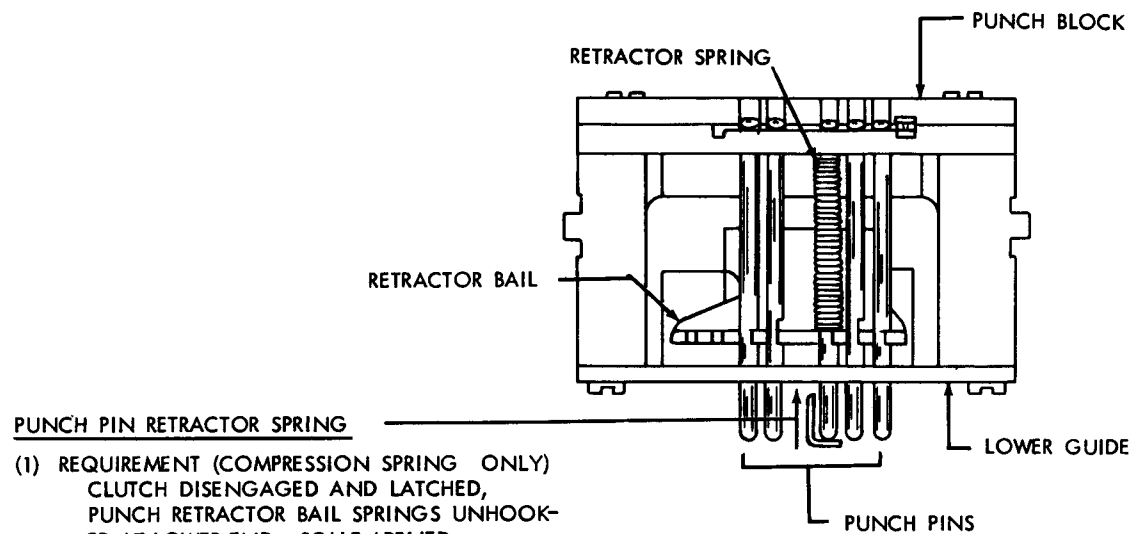
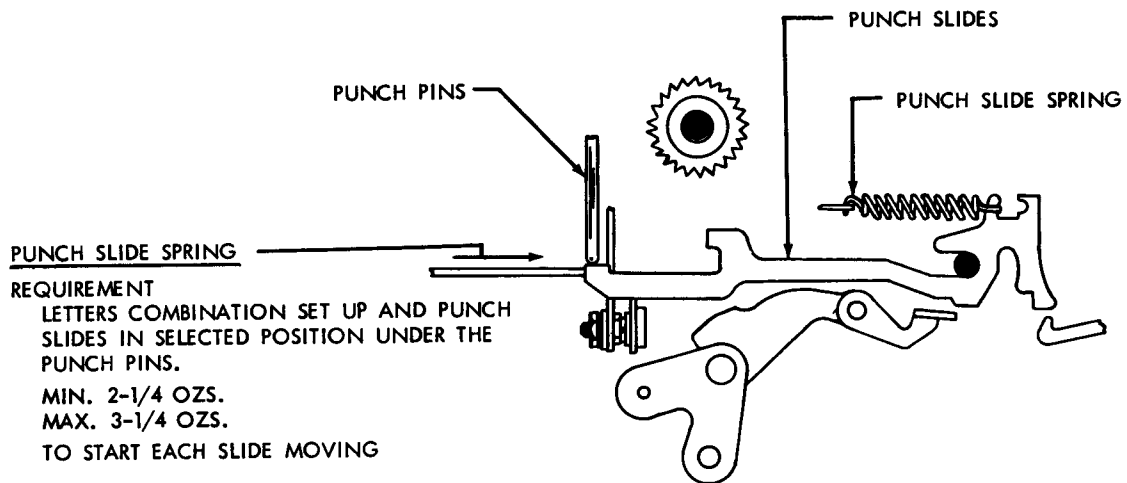
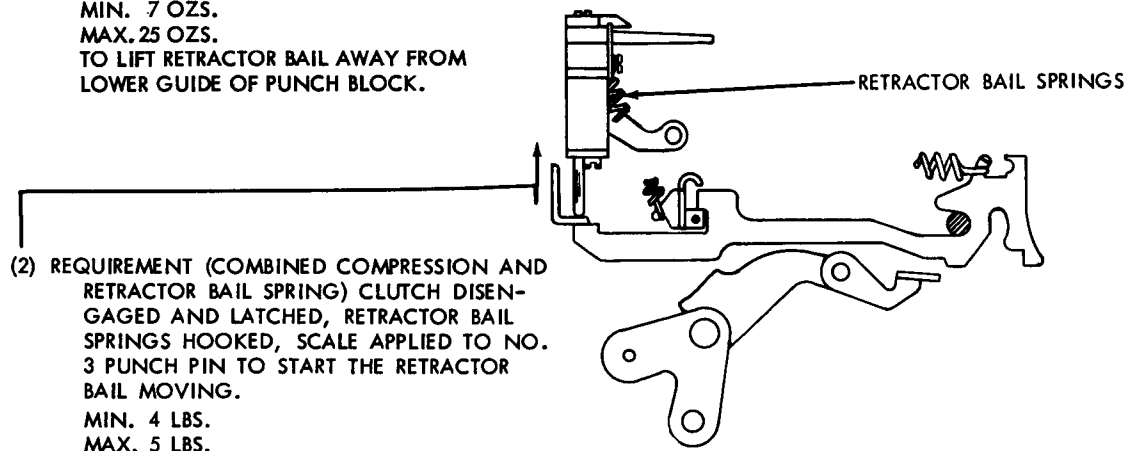


FIGURE 28. TAPE FEED MECHANISM



- (1) REQUIREMENT (COMPRESSION SPRING ONLY)
CLUTCH DISENGAGED AND LATCHED,
PUNCH RETRACTOR BAIL SPRINGS UNHOOK-
ED AT LOWER END. SCALE APPLIED
TO NO. 3 PUNCH PIN
MIN. 7 OZS.
MAX. 25 OZS.
TO LIFT RETRACTOR BAIL AWAY FROM
LOWER GUIDE OF PUNCH BLOCK.



NOTE
TO FACILITATE REHOOKING TENSION SPRINGS
PLACE PUNCH PINS IN HIGHEST POSITION.

FIGURE 29. PUNCH MECHANISM SPRINGS

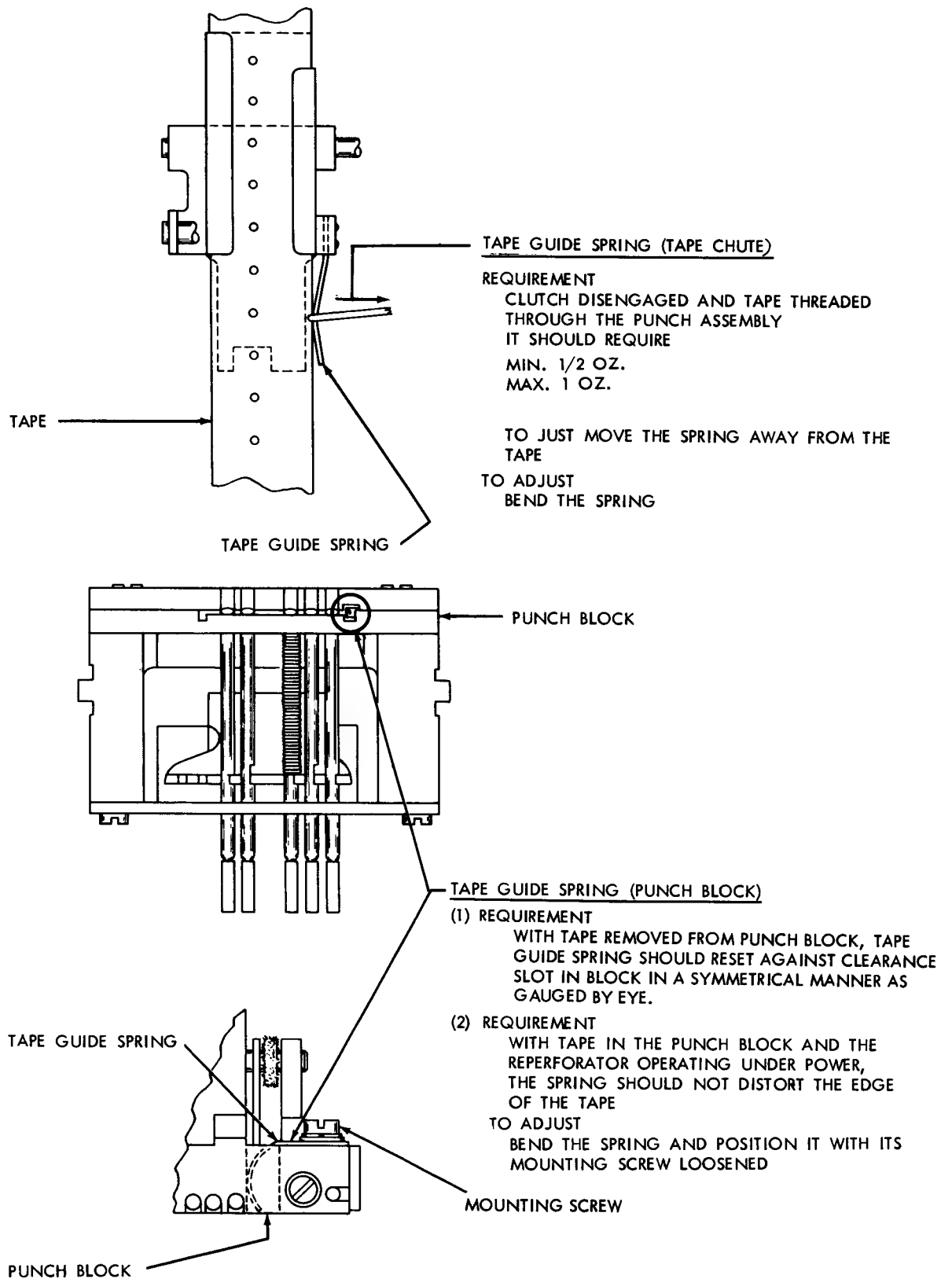


FIGURE 30. TAPE GUIDE SPRINGS

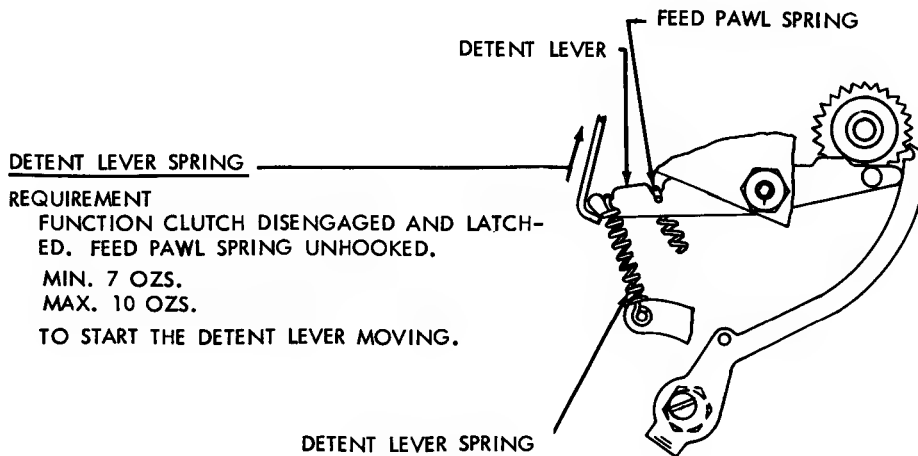
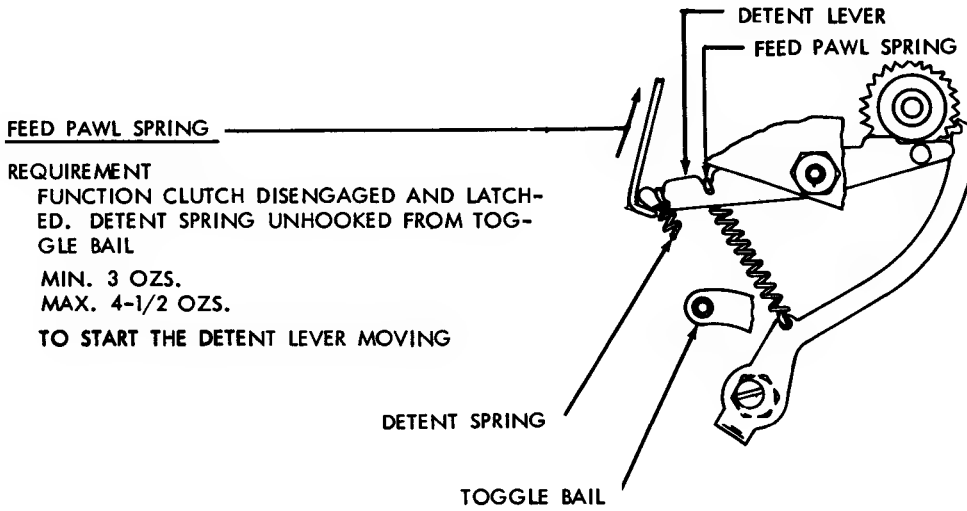


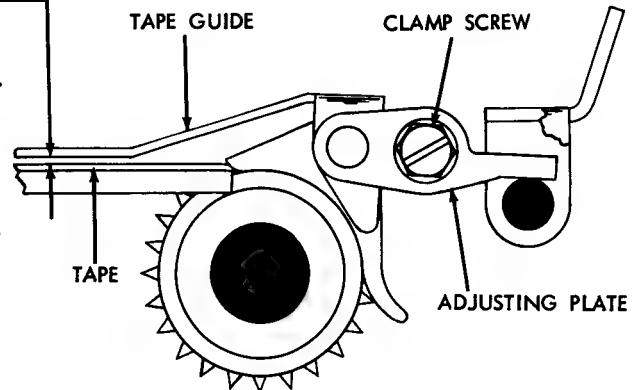
FIGURE 31. TAPE FEED MECHANISM SPRINGS

TAPE GUIDEREQUIREMENT

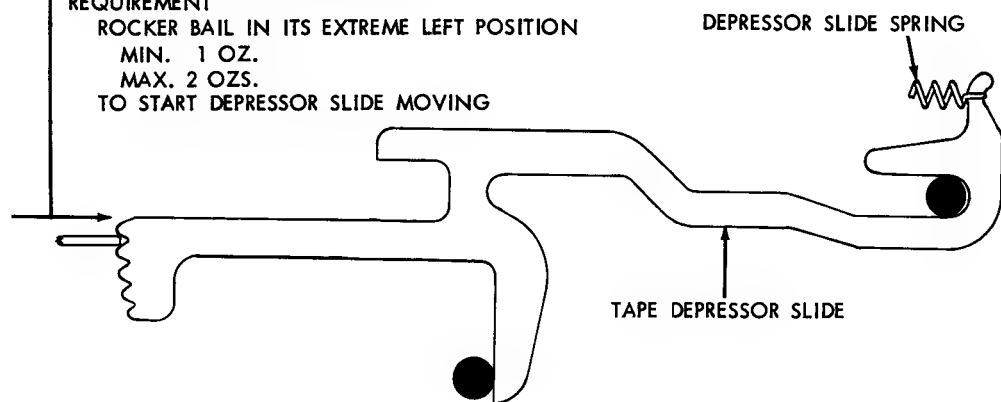
ADJUSTING PLATE RESTING AGAINST
BACKSTOP POST AND TAPE IN PUNCH.
CLEARANCE BETWEEN BOTTOM OF
TAPE GUIDE AND TAPE
MIN. 0.002 INCH
MAX. 0.006 INCH

TO ADJUST

POSITION ADJUSTING PLATE WITH ITS
CLAMP SCREW LOOSENED.

TAPE DEPRESSOR SLIDE SPRINGREQUIREMENT

ROCKER BAIL IN ITS EXTREME LEFT POSITION
MIN. 1 OZ.
MAX. 2 OZS.
TO START DEPRESSOR SLIDE MOVING

TAPE SHOE TORSION SPRINGREQUIREMENT

MIN. 13 OZS.
MAX. 18 OZS.
TO MOVE TAPE SHOE FROM
FEED WHEEL.

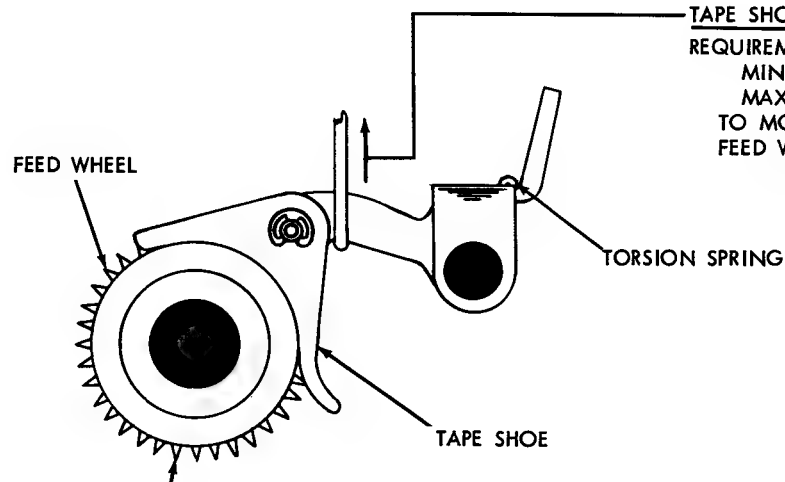


FIGURE 32. TAPE GUIDE AND TAPE DEPRESSOR SLIDE

ARMATURE HINGEREQUIREMENT

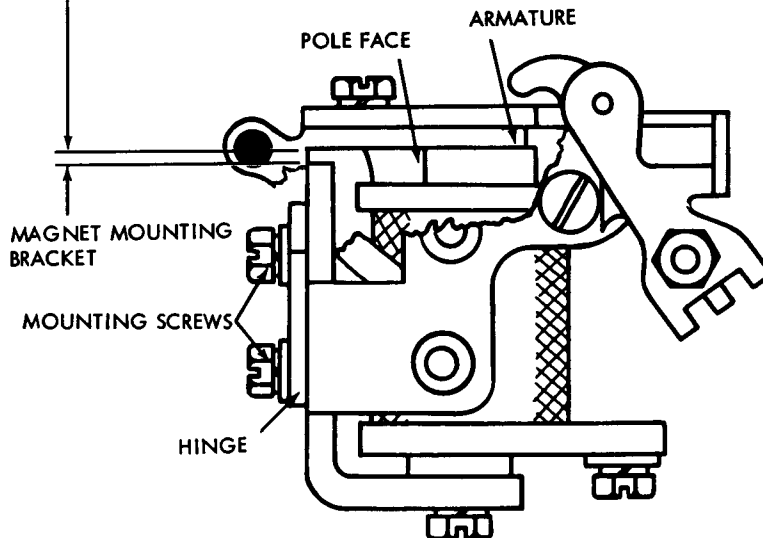
WITH ARMATURE HELD AGAINST POLE FACE (ARMATURE BAIL SPRING UNHOOKED)

MAX. 0.004 INCH

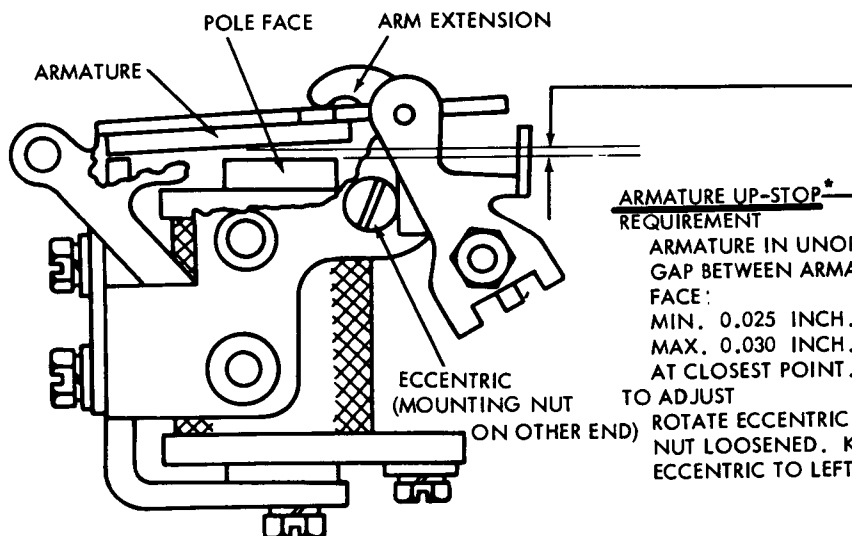
BETWEEN ARMATURE AND MAGNET MOUNTING BRACKET WITH PLAY TAKEN UP FOR MINIMUM.

TO ADJUST

WITH MOUNTING SCREWS LOOSENED,
POSITION HINGE. WHILE ADJUSTMENT
IS BEING MADE, ARMATURE SHOULD
TOUCH FRONT AND REAR OF POLE FACE.

*NOTE:

THIS ADJUSTMENT IS MADE AT FACTORY AND SHOULD NOT BE DISTURBED UNLESS A REASSEMBLY OF THE UNIT IS UNDERTAKEN. IF NECESSARY TO MAKE THIS ADJUSTMENT, THE PUNCH UNIT SHOULD BE REMOVED. SEE DISASSEMBLY AND REASSEMBLY. REMAKE PUNCH UNIT POSITION ADJUSTMENT.

ARMATURE UP-STOP*REQUIREMENT

ARMATURE IN UNOPERATED POSITION.

GAP BETWEEN ARMATURE AND POLE

FACE:

MIN. 0.025 INCH.

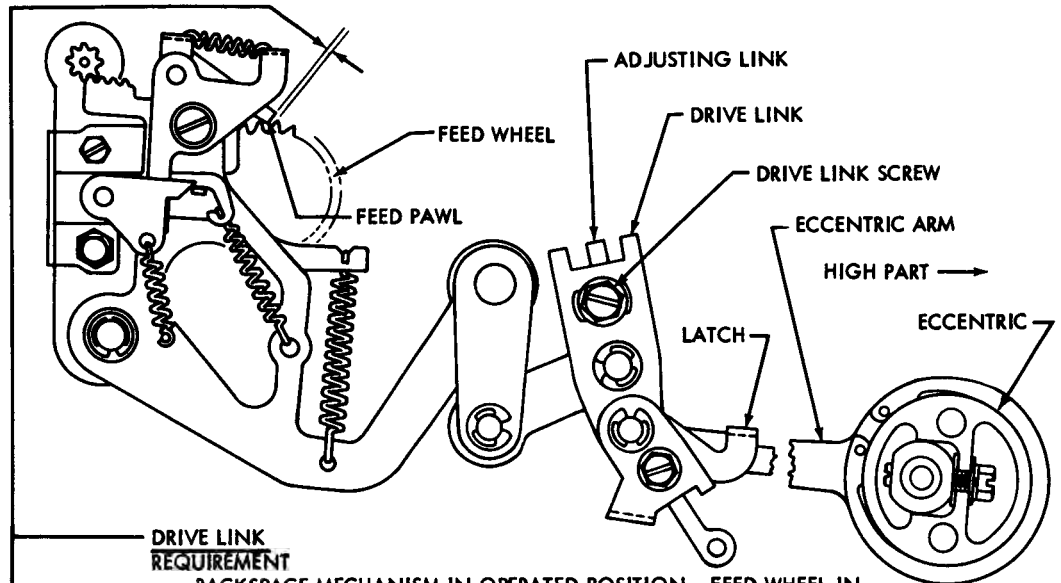
MAX. 0.030 INCH.

AT CLOSEST POINT.

TO ADJUST

ROTATE ECCENTRIC WITH MOUNTING
NUT LOOSENED. KEEP HIGH PART OF
ECCENTRIC TO LEFT.

FIGURE 33. POWER DRIVE BACKSPACE MECHANISM



DRIVE LINK REQUIREMENT

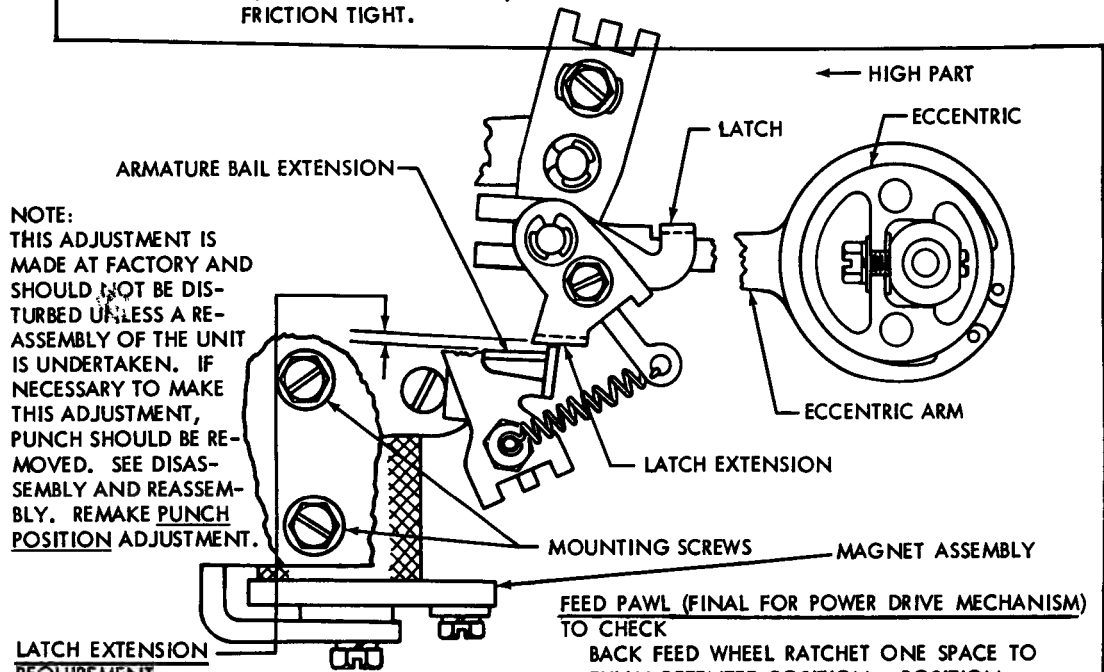
BACKSPACE MECHANISM IN OPERATED POSITION. FEED WHEEL IN DETENTED POSITION. LATCH ENGAGED WITH ECCENTRIC ARM. HIGH PART OF ECCENTRIC TO RIGHT. CLEARANCE BETWEEN FEED PAWL AND FEED WHEEL RATCHET TOOTH

MIN. SOME

MAX. 0.003 INCH

TO ADJUST

BY MEANS OF PRY POINT, POSITION ADJUSTING LINK WITH DRIVE LINK SCREW FRICTION TIGHT.



NOTE:
THIS ADJUSTMENT IS MADE AT FACTORY AND SHOULD NOT BE DISTURBED UNLESS A RE-ASSEMBLY OF THE UNIT IS UNDERTAKEN. IF NECESSARY TO MAKE THIS ADJUSTMENT, PUNCH SHOULD BE REMOVED. SEE DISASSEMBLY AND REASSEMBLY. REMAKE PUNCH POSITION ADJUSTMENT.

LATCH EXTENSION REQUIREMENT

BACKSPACE MECHANISM IN UNOPERATED POSITION. HIGH PART OF ECCENTRIC TO LEFT. ARMATURE AGAINST POLE FACE. LATCH RESTING ON ECCENTRIC ARM NOTCH. CLEARANCE BETWEEN TOP OF ARMATURE BAIL EXTENSION AND LATCH EXTENSION

MIN. 0.005 INCH

MAX. 0.020 INCH

TO ADJUST

SWING MAGNET CLOCKWISE OR COUNTER-CLOCKWISE, AS NECESSARY, WITH MOUNTING SCREWS FRICTION TIGHT.

FEED PAWL (FINAL FOR POWER DRIVE MECHANISM) TO CHECK

BACK FEED WHEEL RATCHET ONE SPACE TO FULLY DETENTED POSITION. POSITION ECCENTRIC ARM TO EXTREME RIGHT. CHECK CLEARANCE BETWEEN PAWL AND RATCHET TOOTH AT FOUR RANDOM POSITIONS ABOUT PERIPHERY OF WHEEL.

REQUIREMENT

CLEARANCE BETWEEN FEED PAWL AND RATCHET TOOTH:

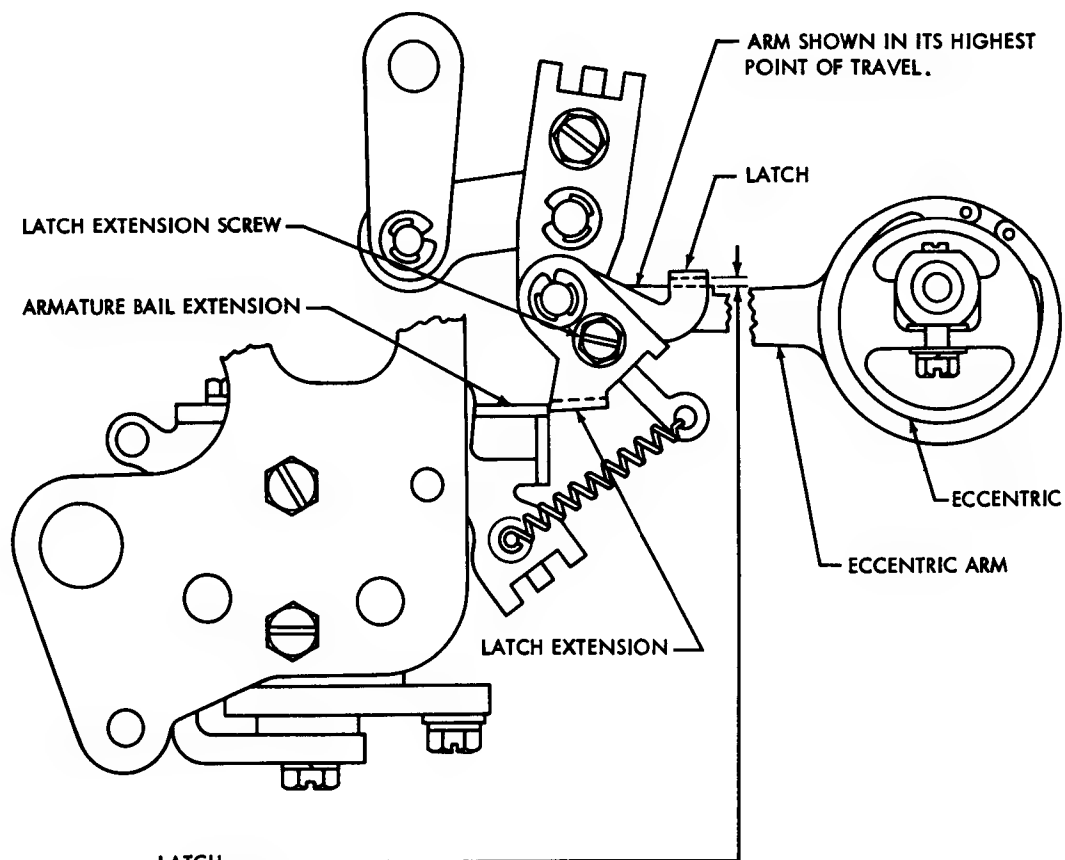
MIN. SOME

MAX. 0.003 INCH

TO ADJUST

BY MEANS OF PRY POINT, POSITION ADJUSTING LINK WITH DRIVE LINK SCREW LOOSENED.

FIGURE 34. POWER DRIVE BACKSPACE MECHANISM



LATCH

REQUIREMENT

BACKSPACE MECHANISM IN UNOPERATED POSITION. ARMATURE OFF POLE FACE (DE-ENERGIZED). LATCH EXTENSION AGAINST END OF ARMATURE BAIL EXTENSION. ECCENTRIC ARM AT ITS CLOSEST POINT TO UNDERSIDE OF LATCH. CLEARANCE BETWEEN LATCH AND ECCENTRIC ARM.

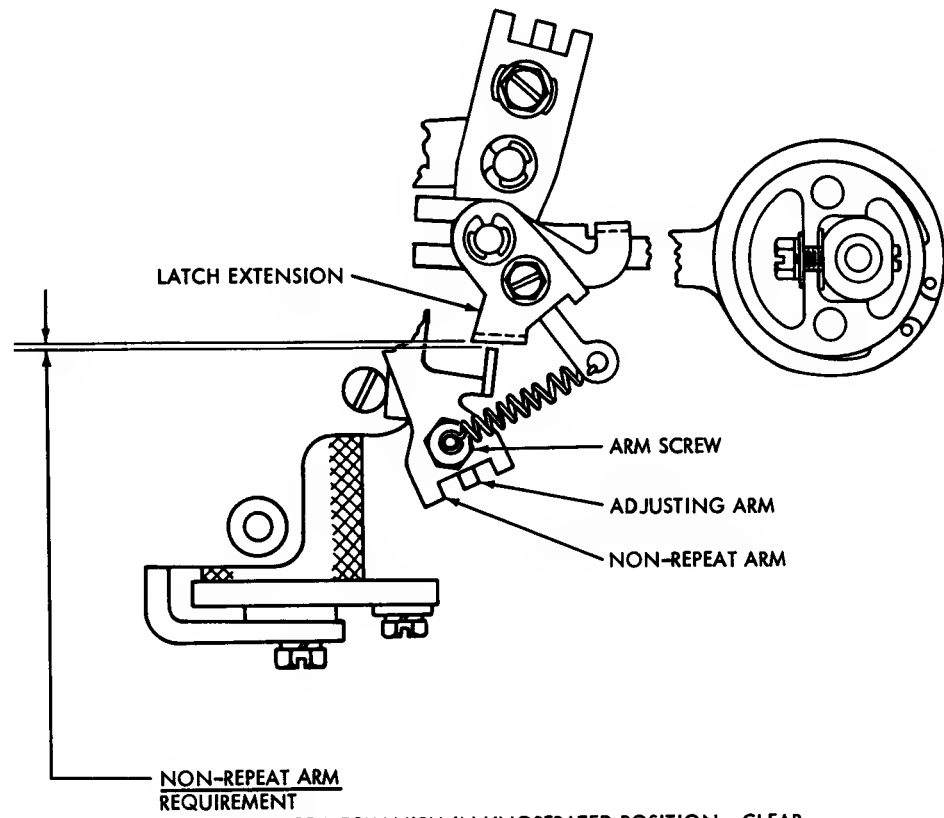
MIN. 0.005 INCH

MAX. 0.025 INCH

TO ADJUST

POSITION LATCH WITH LATCH EXTENSION SCREW LOOSENED.

FIGURE 35. POWER DRIVE BACKSPACE MECHANISM



BACKSPACE MECHANISM IN UNOPERATED POSITION. CLEAR-
ANCE BETWEEN TOP SURFACE OF NON-REPEAT ARM AND
LOWEST POINT OF LATCH EXTENSION

MIN. 0.002 INCH

MAX. 0.010 INCH

TO ADJUST

POSITION ADJUSTING ARM WITH ARM SCREW LOOSENED FRICTION TIGHT.

FIGURE 36. POWER DRIVE BACKSPACE MECHANISM

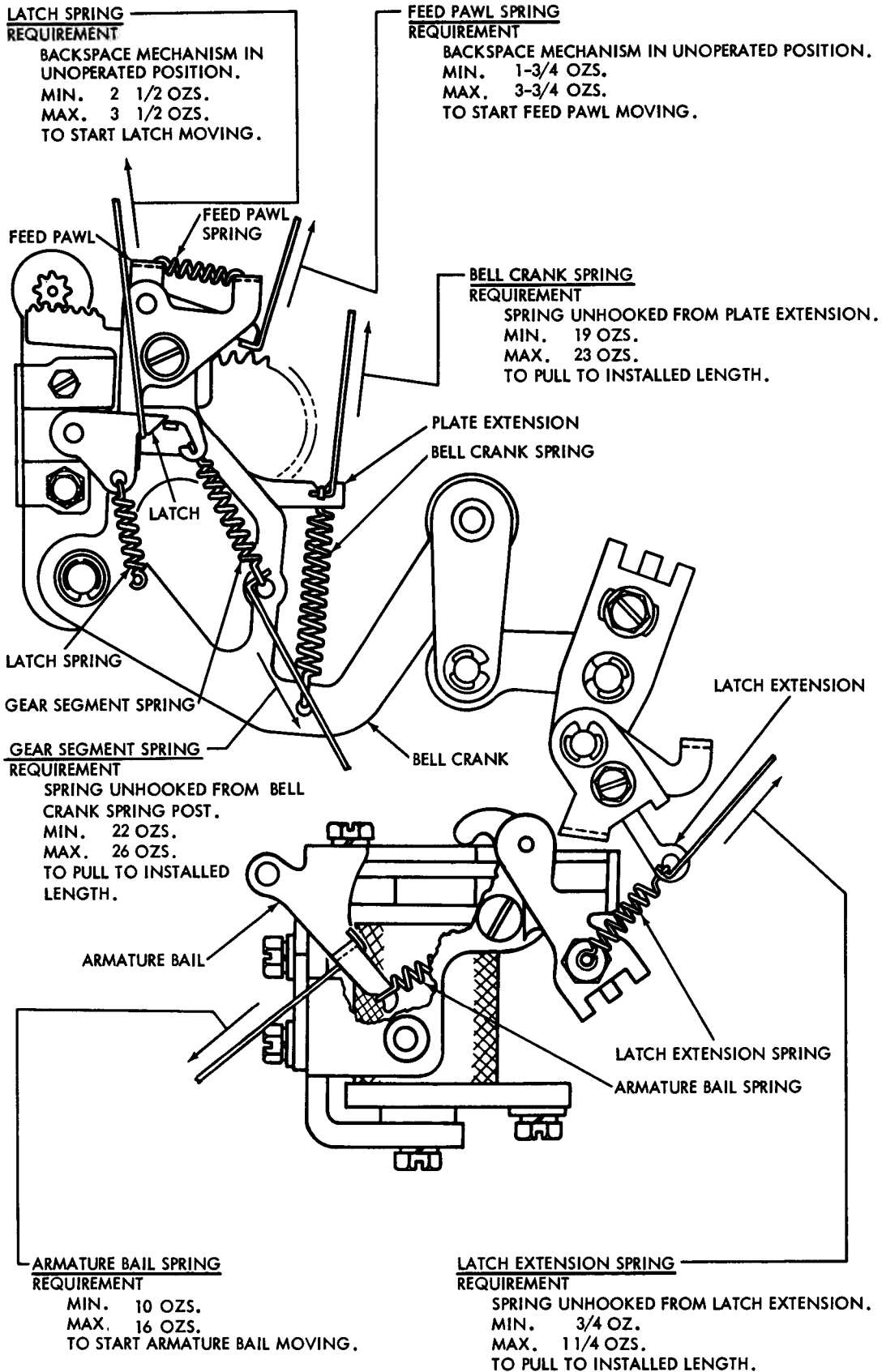


FIGURE 37. POWER DRIVE BACKSPACE MECHANISM

CODE READING AND TIMING CONTACTS

NOTE 1

UNLESS SPECIFICALLY STATED OTHERWISE, THE FOLLOWING CODE READING CONTACT ADJUSTMENTS APPLY TO BOTH THE TRANSFER (BREAK BEFORE MAKE) TYPE AND MAKE TYPE CONTACTS. WHEN AN ADJUSTMENT IS APPLICABLE TO BOTH TYPES, THE TRANSFER TYPE CONTACTS ARE USED IN THE ILLUSTRATIONS.

NOTE 2

IT IS RECOMMENDED THAT THE FOLLOWING ADJUSTMENTS BE MADE WITH THE CODE READING CONTACT ASSEMBLY REMOVED FROM THE UNIT.

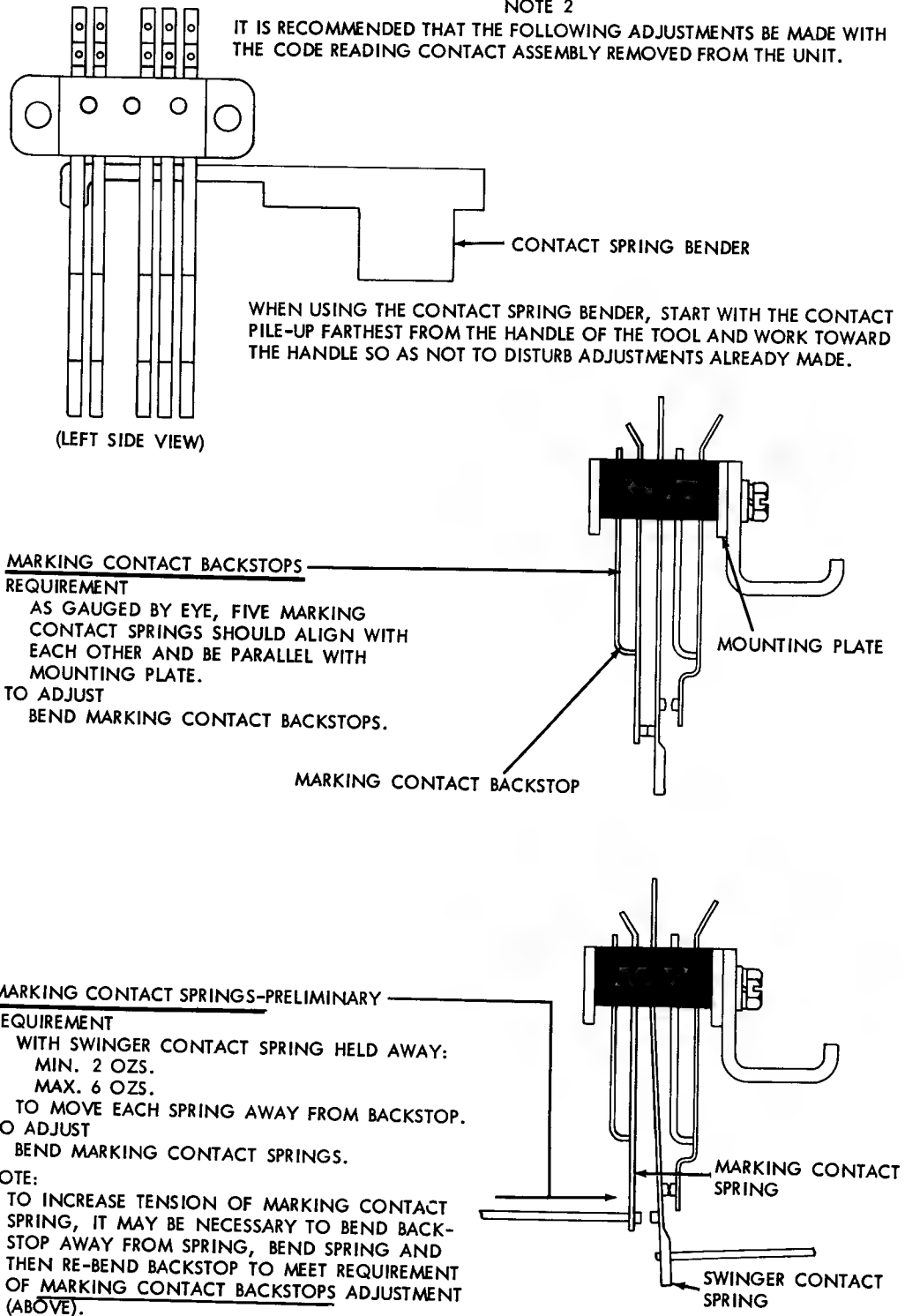
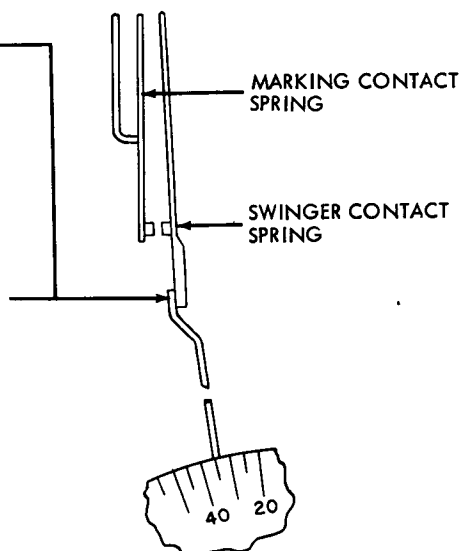


FIGURE 38. CODE READING CONTACTS

SWINGER CONTACT SPRINGS-PRELIMINARY REQUIREMENT

MIN. 30 GRAMS
MAX. 40 GRAMS
TO OPEN MARKING CONTACTS.
TO ADJUST
BEND SWINGER CONTACT SPRINGS.

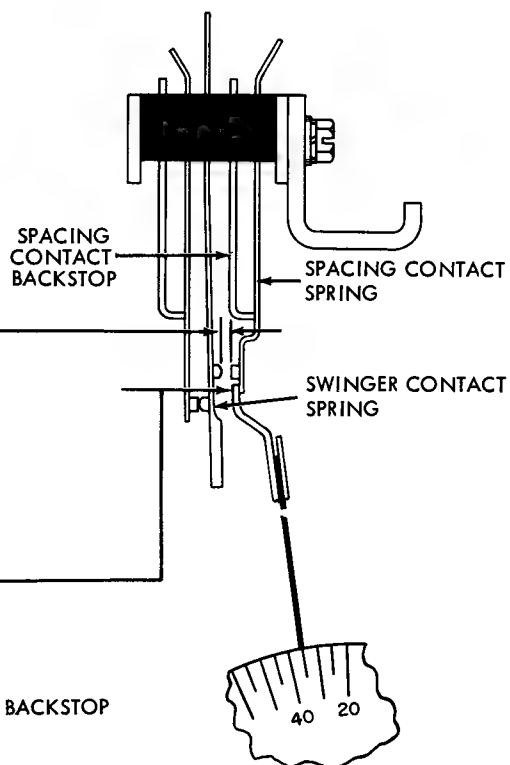


NOTE:

SPACING CONTACTS (ON TRANSFER TYPE CONTACT ASSEMBLIES ONLY)
ARE NORMALLY OPEN WHEN CONTACT ASSEMBLY IS REMOVED FROM UNIT.

SPACING CONTACT BACKSTOPS (APPLIES TO TRANSFER TYPE CONTACTS ONLY)

REQUIREMENT
GAP BETWEEN SPACING CONTACTS
MIN. 0.025 INCH
MAX. 0.030 INCH
TO ADJUST
BEND SPACING CONTACT BACKSTOPS.



SPACING CONTACT SPRINGS-PRELIMINARY (APPLIES TO TRANSFER TYPE CONTACTS ONLY)

REQUIREMENT
MIN. 30 GRAMS
MAX. 40 GRAMS
TO MOVE EACH CONTACT SPRING AWAY FROM BACKSTOP
TO ADJUST
BEND SPACING CONTACT SPRINGS.

NOTE:

TO INCREASE TENSION OF SPRING, IT MAY BE NECESSARY TO BEND BACKSTOP AWAY FROM SPRING, BEND SPRING, AND THEN RE-BEND BACKSTOP TO MEET REQUIREMENT OF SPACING CONTACT BACKSTOPS ADJUSTMENT ABOVE.

FIGURE 39. CODE READING CONTACTS

NOTE:
THE FOLLOWING CODE READING CONTACT ADJUSTMENTS SHOULD
BE MADE WITH THE CONTACT ASSEMBLIES MOUNTED ON THE UNIT.

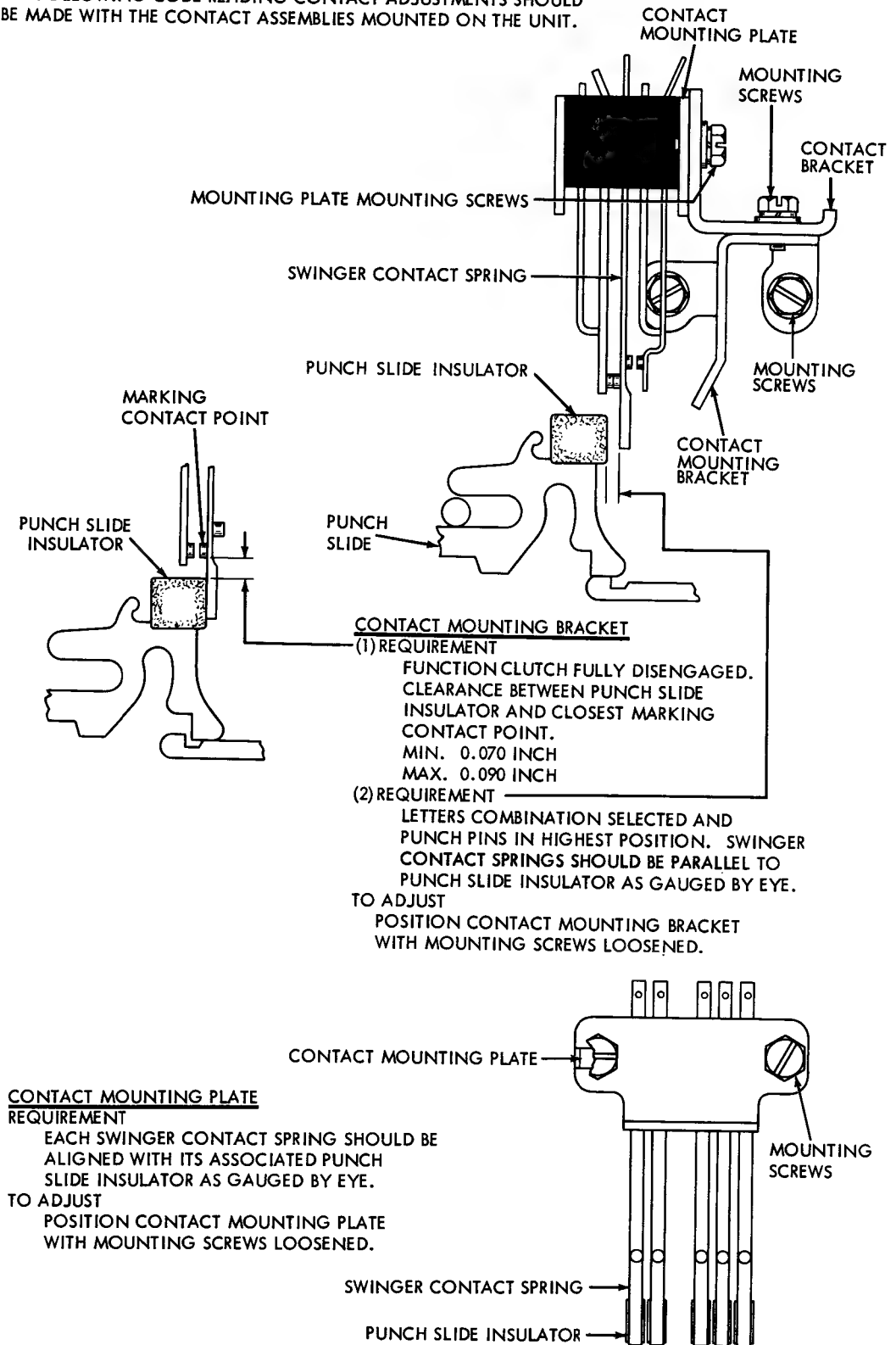
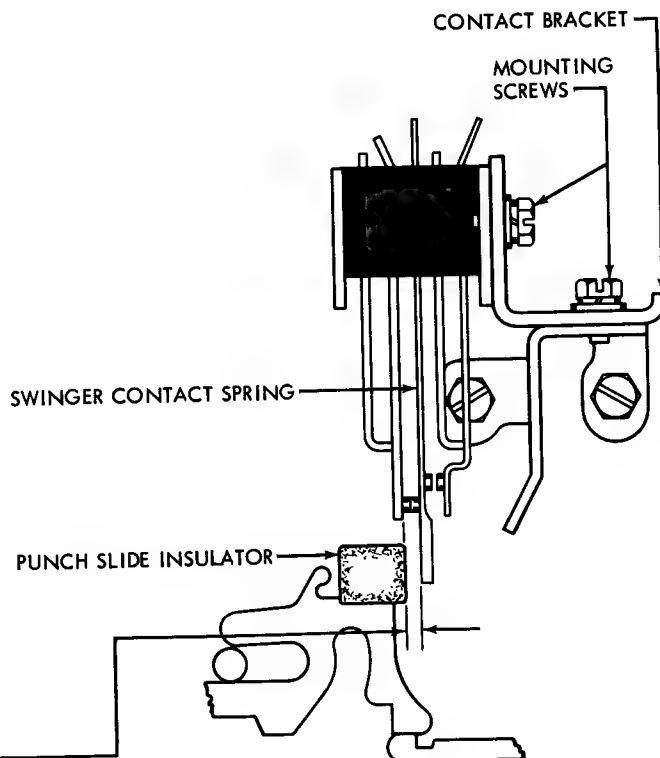
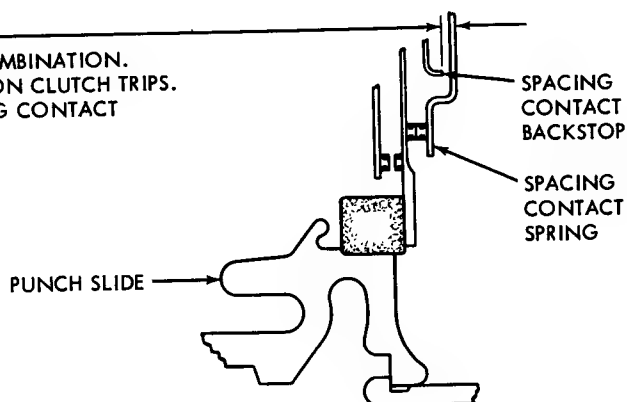


FIGURE 40. CODE READING CONTACTS

CONTACT BRACKET-PRELIMINARY (APPLIES TO TRANSFER TYPE CONTACTS ONLY)

(1) REQUIREMENT

MANUALLY SELECT BLANK CODE COMBINATION. ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS. SOME CLEARANCE BETWEEN SPACING CONTACT SPRING AND ITS BACKSTOP. MAX. 0.008 INCH



(2) REQUIREMENT

MANUALLY SELECT LETTERS CODE COMBINATION. ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS. CLEARANCE BETWEEN PUNCH SLIDE INSULATOR AND SWINGER CONTACT SPRING. MIN. 0.028 INCH

TO ADJUST

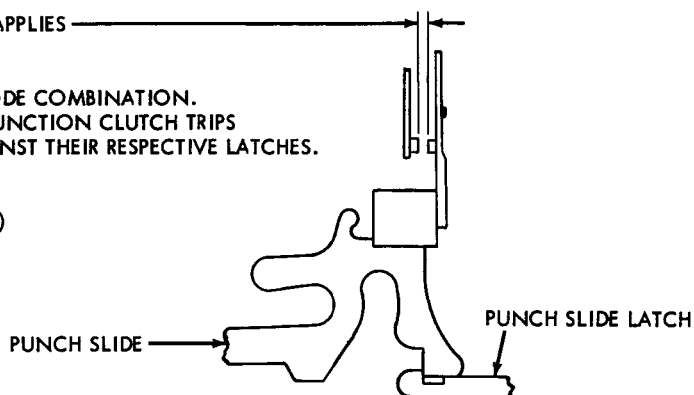
POSITION CONTACT BRACKET WITH ITS MOUNTING SCREWS. LOOSENED TO MEET REQUIREMENT (1). TO PRY BRACKET TO LEFT, INSERT SCREWDRIVER BETWEEN BRACKET AND LEFT EDGE OF MOUNTING SCREWS; TO PRY BRACKET TO RIGHT, INSERT SCREWDRIVER BETWEEN BRACKET AND RIGHT EDGE OF MOUNTING SCREWS. CHECK REQUIREMENT (2). IF NOT MET, REFINES ADJUSTMENT.

FIGURE 41. CODE READING CONTACTS

CONTACT BRACKET-PRELIMINARY (APPLIES TO MAKE TYPE CONTACTS ONLY)

(1) REQUIREMENT

MANUALLY SELECT BLANK CODE COMBINATION.
ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS
AND PUNCH SLIDES ARE AGAINST THEIR RESPECTIVE LATCHES.
GAP BETWEEN CONTACTS.
MIN. 0.010 INCH
MAX. 0.015 INCH (SEE NOTE)

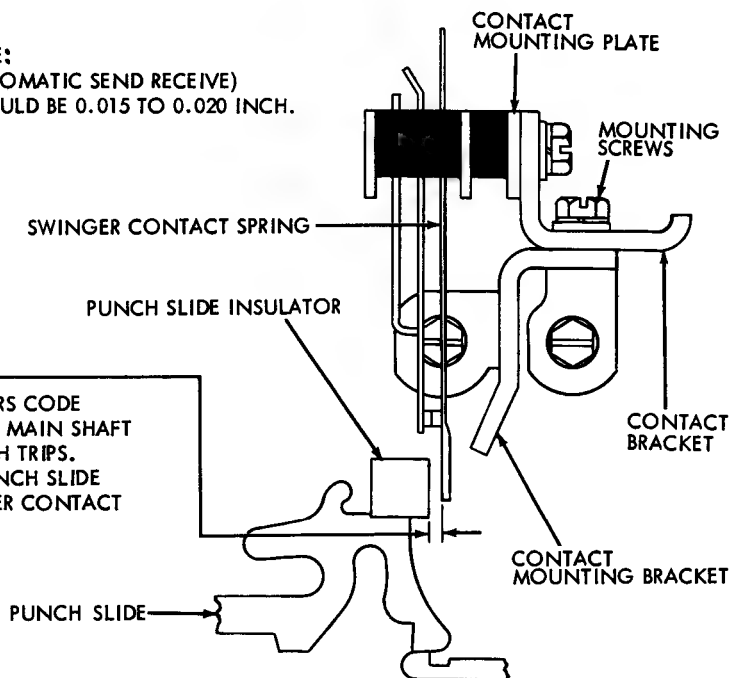


NOTE:

FOR UNITS USED ON ASR (AUTOMATIC SEND RECEIVE)
SETS, THE CONTACT GAP SHOULD BE 0.015 TO 0.020 INCH.

(2) REQUIREMENT

MANUALLY SELECT LETTERS CODE
COMBINATION. ROTATE MAIN SHAFT
UNTIL FUNCTION CLUTCH TRIPS.
CLEARANCE BETWEEN PUNCH SLIDE
INSULATOR AND SWINGER CONTACT
SPRING:
MIN. 0.028 INCH



TO ADJUST

POSITION CONTACT BRACKET WITH MOUNTING SCREWS
FRICTION TIGHT. TO PRY BRACKET TO LEFT,
INSERT SCREW DRIVER BETWEEN BRACKET AND
LEFT EDGE OF MOUNTING SCREW; TO PRY BRACKET TO
RIGHT, INSERT SCREW DRIVER BETWEEN BRACKET
AND RIGHT EDGE OF MOUNTING SCREW.

FIGURE 42. CODE READING CONTACTS

NOTE:

THERE ARE TWO TYPES OF TIMING CONTACT ASSEMBLIES, SINGLE AND DOUBLE. SINGLE CONTACT ASSEMBLIES HAVE A FRONT CONTACT ONLY, NO REAR CONTACT. IF UNIT IS EQUIPPED WITH A DOUBLE CONTACT ASSEMBLY, THE FOLLOWING ADJUSTMENTS APPLY TO BOTH FRONT AND REAR CONTACTS.

NOTE:

IN CASE OF SINGLE-CONTACT ASSEMBLY, MAKE CERTAIN CONTACT BRACKET MOUNTING SCREWS ARE CENTRALLY LOCATED IN ELONGATED SLOTS, AND PROCEED TO NEXT ADJUSTMENT.

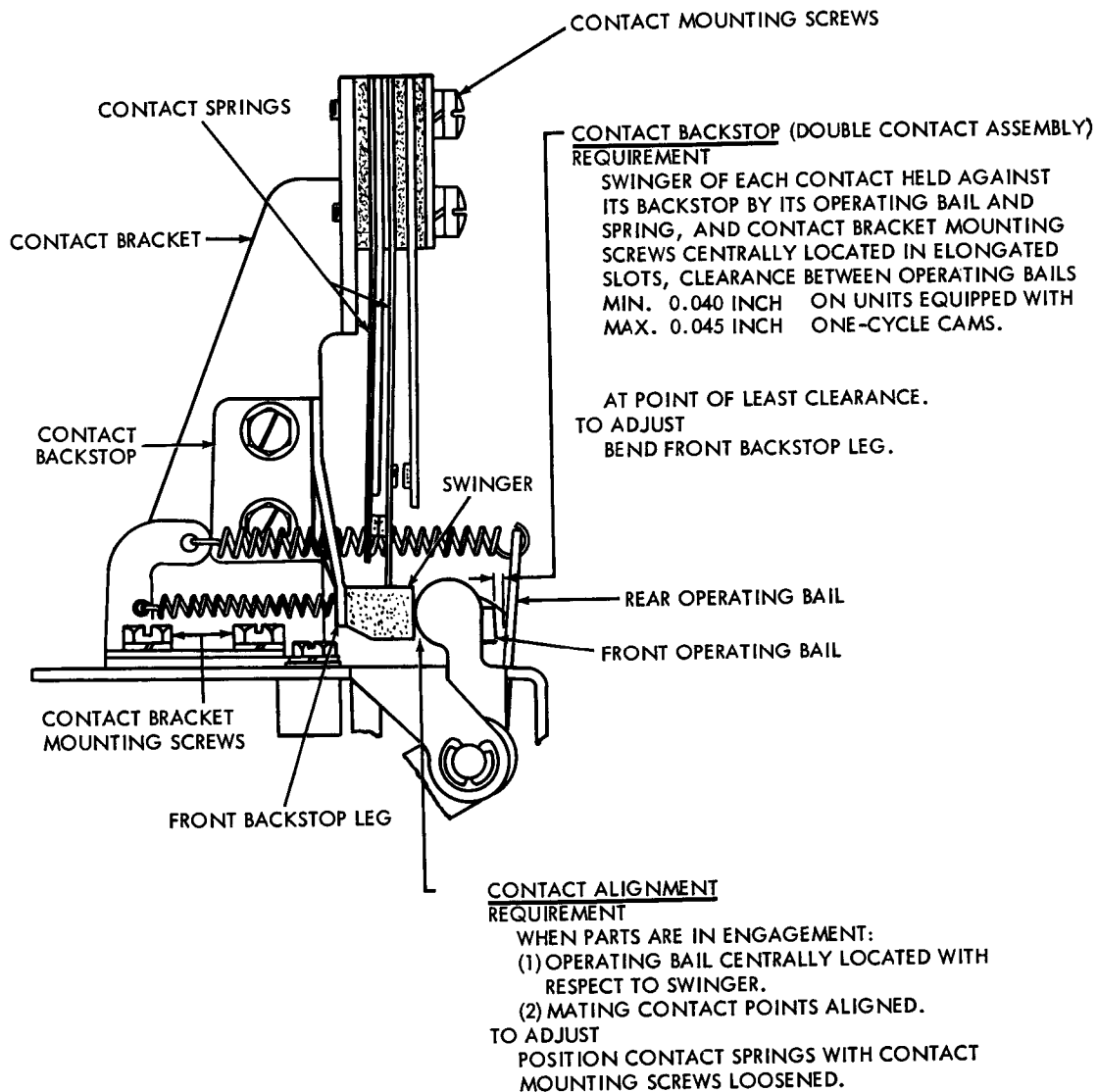


FIGURE 43. TIMING CONTACTS

NOTE:
IT IS RECOMMENDED THAT THE FOLLOWING TIMING CONTACT ADJUSTMENTS
BE MADE WITH CONTACT ASSEMBLIES REMOVED FROM THE UNIT.

RIGHT CONTACT SPRING

NOTE

THIS ADJUSTMENT APPLIES ONLY TO
ASSEMBLIES WITH LEAF CONTACT SPRING
AND STIFFENER SHOWN BY DOTTED LINES.

REQUIREMENT

SWINGER HELD AGAINST BACKSTOP.

MIN. 1 OZ.

MAX. 5 OZS.

TO MOVE SPRING AWAY FROM STIFFENER.

TO ADJUST

BEND RIGHT (THICK) CONTACT SPRING.

RIGHT CONTACT GAP (NORMALLY CLOSED WHEN CONTACT ASSEMBLY IS REMOVED FROM UNIT).

REQUIREMENT

SWINGER HELD AGAINST ITS BACKSTOP.

GAP BETWEEN CONTACTS:

MIN. 0.020 INCH

MAX. 0.025 INCH

TO ADJUST

BEND RIGHT CONTACT SPRING.

SWINGER CONTACT SPRING-PRELIMINARY

REQUIREMENT

OPERATING BAIL HELD AWAY FROM SWINGER:

MIN. 4-1/2 OZS.

MAX. 5-1/2 OZS.

TO OPEN RIGHT SIDE OF CONTACT

TO ADJUST

BEND SWINGER CONTACT SPRING. RECHECK
RIGHT CONTACT GAP AND READJUST IF
NECESSARY.

LEFT CONTACT GAP (NORMALLY OPEN WHEN CONTACT ASSEMBLY IS REMOVED FROM UNIT)

REQUIREMENT

OPERATING BAIL HELD AWAY FROM
SWINGER, GAP BETWEEN CONTACTS:

MIN. 0.020 INCH

MAX. 0.025 INCH

TO ADJUST

BEND STIFFENER.

LEFT CONTACT SPRING-PRELIMINARY

REQUIREMENT

SWINGER HELD AGAINST BACKSTOP BY
ITS OPERATING BAIL AND SPRING.

MIN. 4-1/2 OZS.

MAX. 5-1/2 OZS.

TO OPEN LEFT SIDE OF CONTACT.

TO ADJUST

BEND LEFT CONTACT SPRING. RECHECK
RIGHT CONTACT GAP AND LEFT CONTACT
GAP, AND READJUST IF NECESSARY.

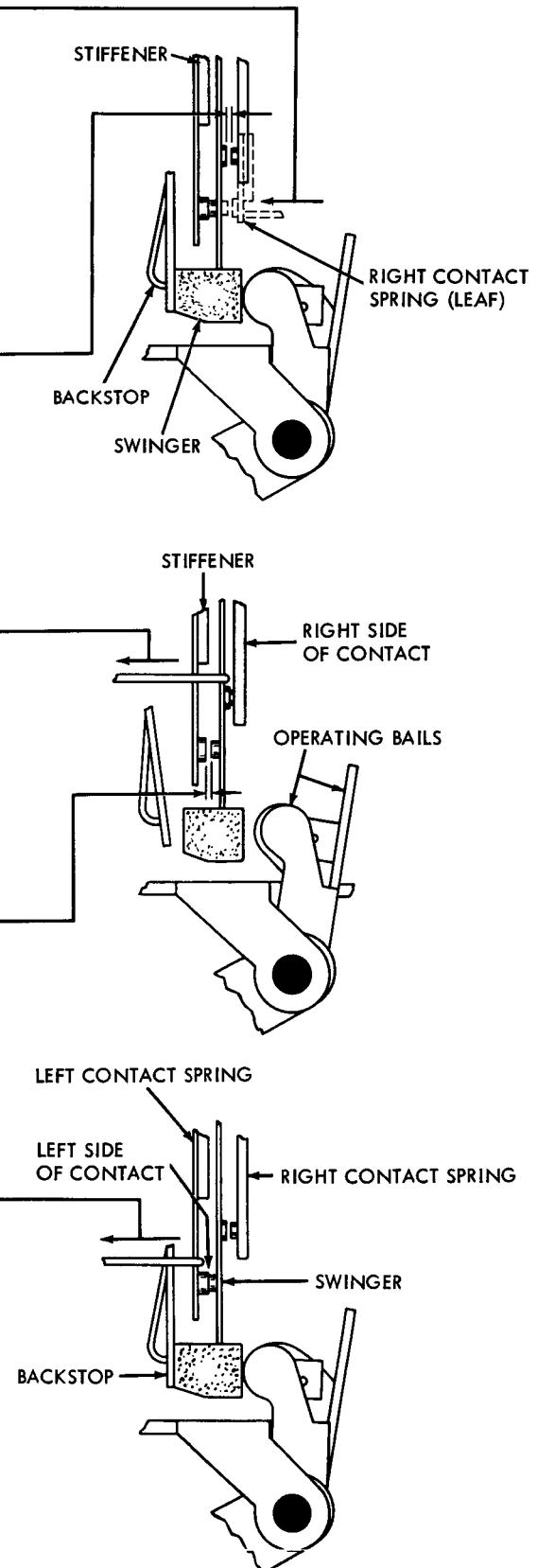
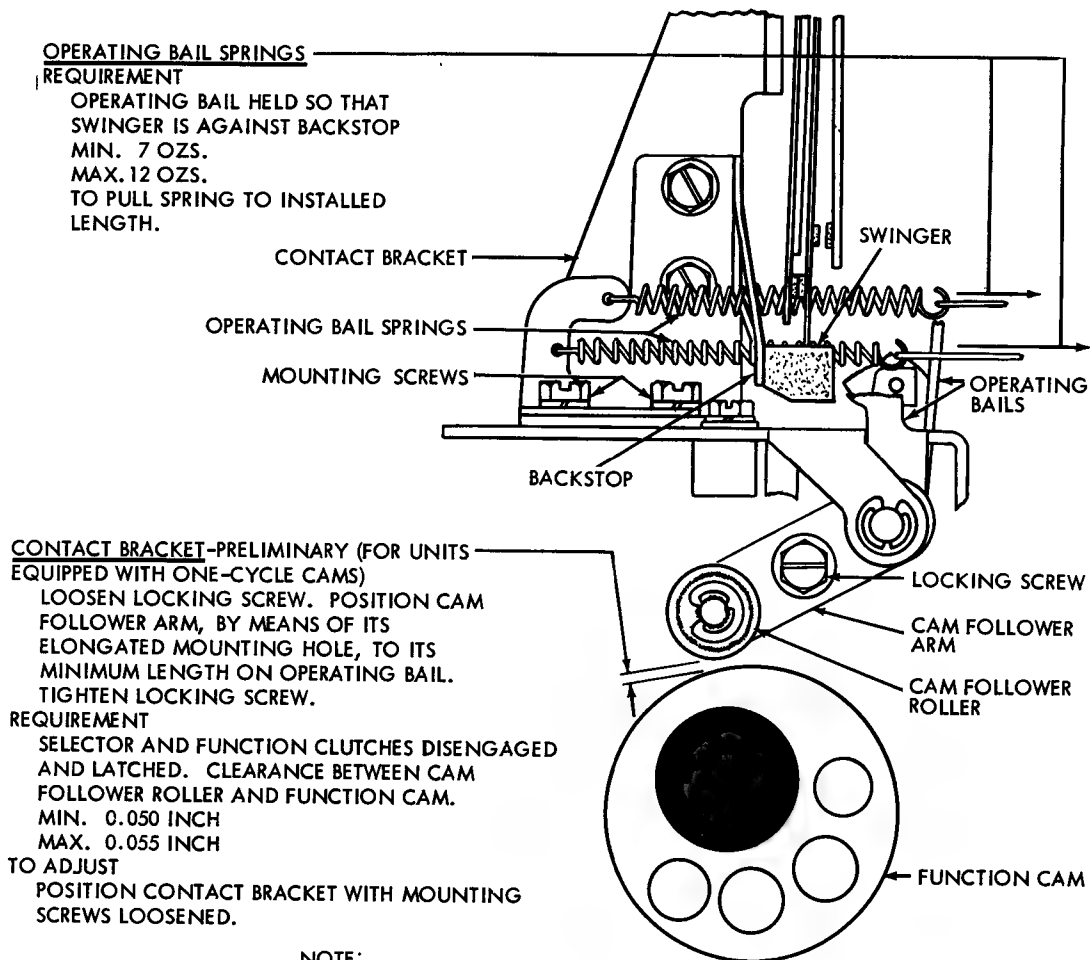
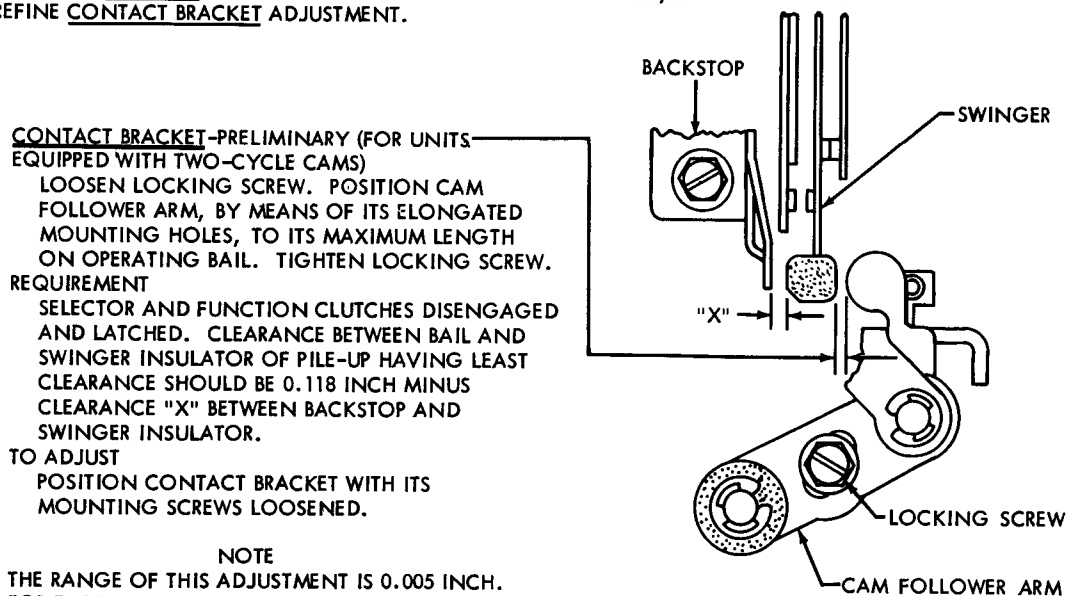


FIGURE 44. TIMING CONTACTS

NOTE:
THE FOLLOWING TIMING CONTACT ADJUSTMENTS SHOULD BE
MADE WITH CONTACT ASSEMBLY MOUNTED ON UNIT.



NOTE:
ON UNITS EQUIPPED WITH DOUBLE CONTACT ASSEMBLIES, RECHECK
CONTACT BACKSTOP ADJUSTMENT. IF REQUIREMENT IS NOT MET,
REFINE CONTACT BRACKET ADJUSTMENT.



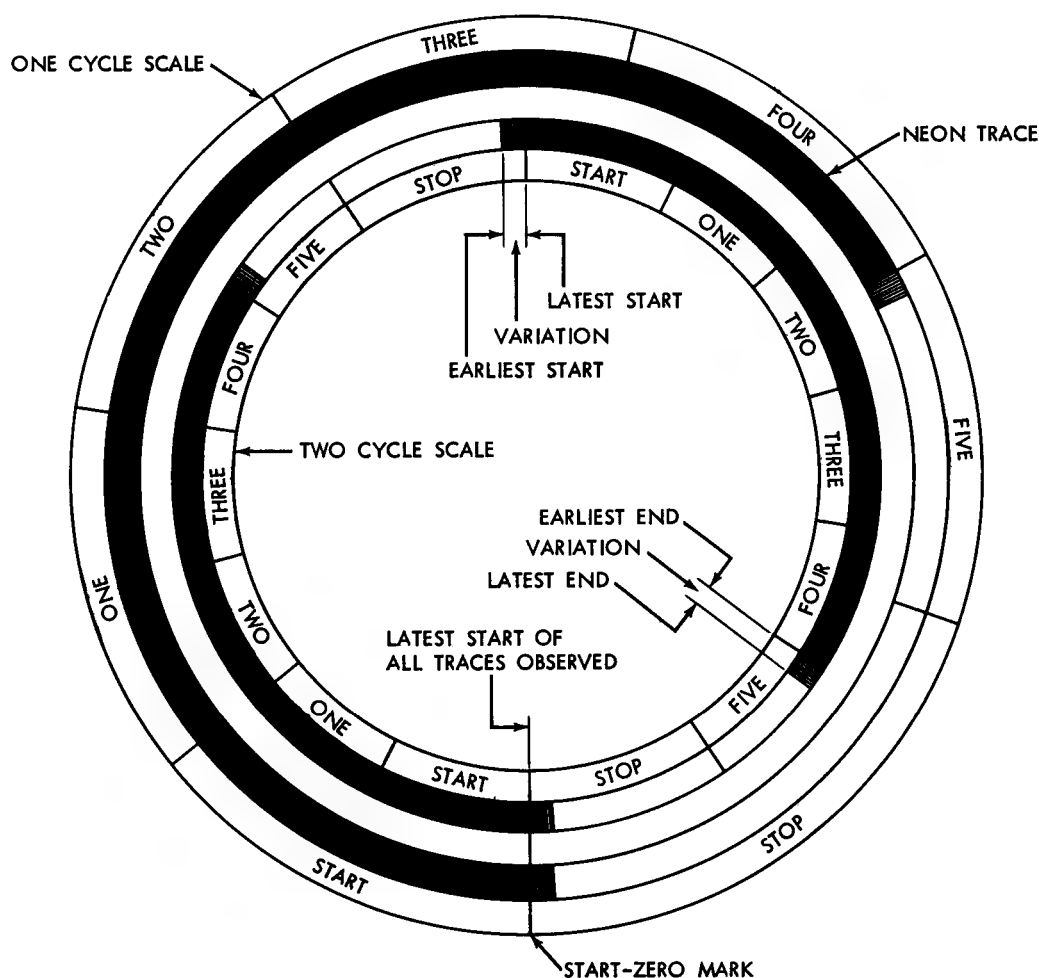
NOTE
THE RANGE OF THIS ADJUSTMENT IS 0.005 INCH.
FOR EXAMPLE; IF CLEARANCE "X" IS 0.080 INCH,
THE NOMINAL ADJUSTMENT IS 0.038 INCH AND
THE RANGE OF ADJUSTMENT IS 0.035 INCH TO
0.040 INCH.

FIGURE 45. TIMING CONTACTS

THE FOLLOWING TESTS REQUIRE THE USE OF A TELETYPE SIGNAL DISTORTION TEST SET. THEY SHOULD BE MADE AFTER THE CONTACT ASSEMBLIES HAVE BEEN ADJUSTED AS INSTRUCTED ON THE PRECEDING PAGES. WHERE REQUIREMENTS ARE NOT MET, DESIGNATED ADJUSTMENTS MUST BE REFINED. AND/OR RELATED LENGTHS MAY HAVE TO BE CHANGED TO MEET TIMING REQUIREMENTS.

TESTS ON 600 OPERATION PER MINUTE UNITS OR LOWER SHOULD BE MADE WITH THE PERFORATOR OR REPERFORATOR AND THE TEST SET OPERATING AT 600 O.P.M.
 TESTS ON 900 O.P.M. UNITS USED ON THE AUTOMATIC SEND-RECEIVE (ASR) SET SHOULD BE MADE WITH THE TEST SET OPERATING AT 600 O.P.M. AND USING KEYBOARD TRANSMISSION.
 TESTS ON 1200 O.P.M. UNITS SHOULD BE MADE WITH THE REPERFORATOR OPERATING AT 1200 O.P.M. AND THE TEST SET EQUIPPED WITH A TWO CYCLE SCALE AND OPERATING AT 600 O.P.M.

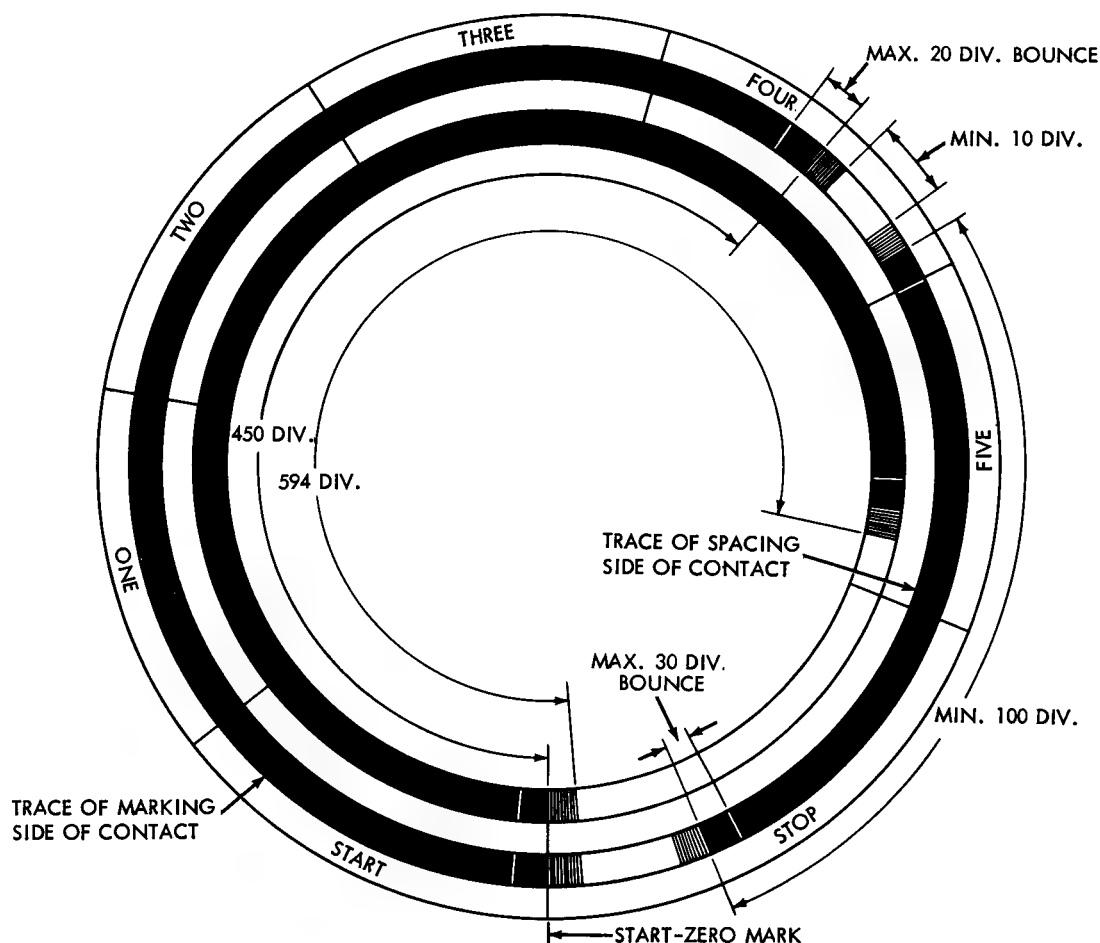
OBSERVATIONS ARE TO BE MADE OF A NEON TRACE ON THE GRADUATED DISK OF A TEST SET. TRACE WILL HAVE TENDENCY TO "JUMP"; THAT IS, IT WILL NOT BE STEADY ENOUGH TO BE ACCURATELY MEASURED. VARIATION MAY BE AS HIGH AS TEN DIVISIONS ON SCALE. MINIMUM SIGNAL LENGTH IS MEASURED BETWEEN LATEST START AND EARLIEST END OF ALL TRACES. MAXIMUM SIGNAL LENGTH IS MEASURED BETWEEN EARLIEST START AND LATEST END OF ALL TRACES.



TO ZERO TEST SET
 CONNECT NEON TRACE TO NO. 1 CODE READING CONTACT (REARMOST). WITH UNIT RECEIVING LETTERS CODE COMBINATIONS, OBSERVE AND NOTE POINT AT WHICH TRACE ENDS. TRACES WILL JUMP AS DESCRIBED ABOVE; NOTE EARLIEST END OF TRACES. REPEAT FOR REMAINING CONTACTS. OF ALL TRACES OBSERVED, CHOOSE ONE THAT STARTS THE LATEST. SET "START-ZERO" MARK OF SCALE AT LATEST START OF CHOSEN TRACE. RECORD EARLIEST END OF CHOSEN TRACE FOR FUTURE ADJUSTMENT REFERENCES.

FIGURE 46. SIGNAL DISTORTION TEST SET

NOTE:
TEST PROCEDURES ON THIS PAGE APPLY TO 600 O.P.M. UNITS OR LOWER ONLY.

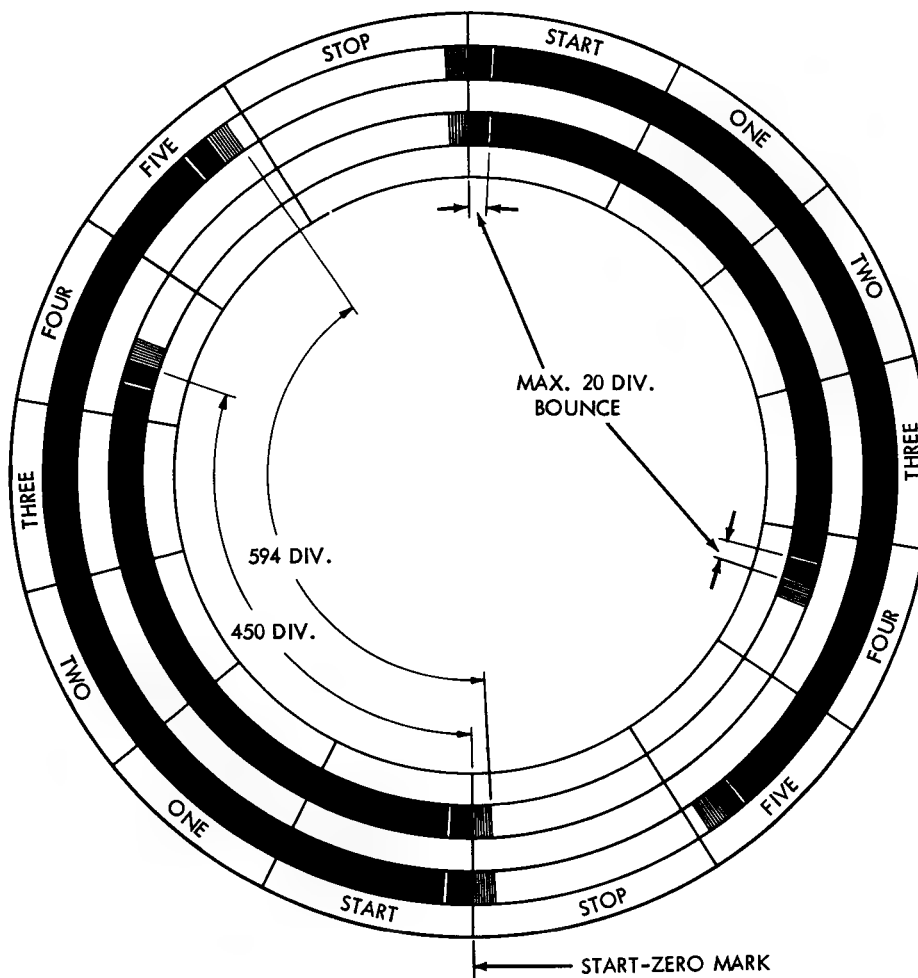


CODE READING CONTACTS

- (1) ZERO TEST SET AS PREVIOUSLY INSTRUCTED.
- (2) CONNECT NEON TRACE TO MARKING SIDE OF A CODE READING CONTACT (NORMALLY OPEN WHEN UNIT IS IN IDLE CONDITION). WITH UNIT RECEIVING CONTINUOUS LETTERS CODE COMBINATIONS, OBSERVE TRACE. REPEAT FOR ALL FIVE CONTACTS.
REQUIREMENTS
 - A. SIGNAL LENGTH FOR EACH CONTACT TRACE AND COMBINED CONTACT TRACES.
MIN. 450 DIVISIONS
MAX. 594 DIVISIONS
 - B. BOUNCE SHOULD END WITHIN MAX. OF 20 DIVISIONS OF LATEST START AND EARLIEST END OF ALL TRACES.
- (3) (APPLIES TO TRANSFER TYPE CONTACTS ONLY) CONNECT NEON TRACE TO BOTH SIDES OF CONTACT. WITH UNIT RECEIVING LETTERS CODE COMBINATIONS, OBSERVE TRACE.
REQUIREMENTS
 - A. BREAK IN TRACE INDICATING BREAK BEFORE MAKE.
MIN. 10 DIVISIONS
 - B. SIGNAL LENGTH OF SPACING SIDE OF CONTACT
MIN. 100 DIVISIONS
 - C. BOUNCE SHOULD END WITHIN 30 DIVISIONS OF LATEST START AND EARLIEST END OF TRACE.
- (4) TO ADJUST
 - A. IF REQUIREMENTS UNDER (2) A., (3) A., OR (3) B. ARE NOT MET, REFINE CONTACT BRACKET ADJUSTMENT. WHEN REFINING (2) A., ATTEMPT TO ADJUST TOWARD MAXIMUM SIGNAL LENGTH.
 - B. IF BOUNCE REQUIREMENTS UNDER (2) B. AND (3) C. ARE NOT MET, REFINE SWINGER CONTACT SPRING AND SPACING CONTACT SPRING TENSIONS.
 - C. IF ANY REFINEMENTS ARE NECESSARY, REPEAT COMPLETE TEST PROCEDURE.

FIGURE 47. SIGNAL DISTORTION TEST SET

NOTE
TEST PROCEDURES ON THIS PAGE APPLY TO 1200 O.P.M. UNITS ONLY.



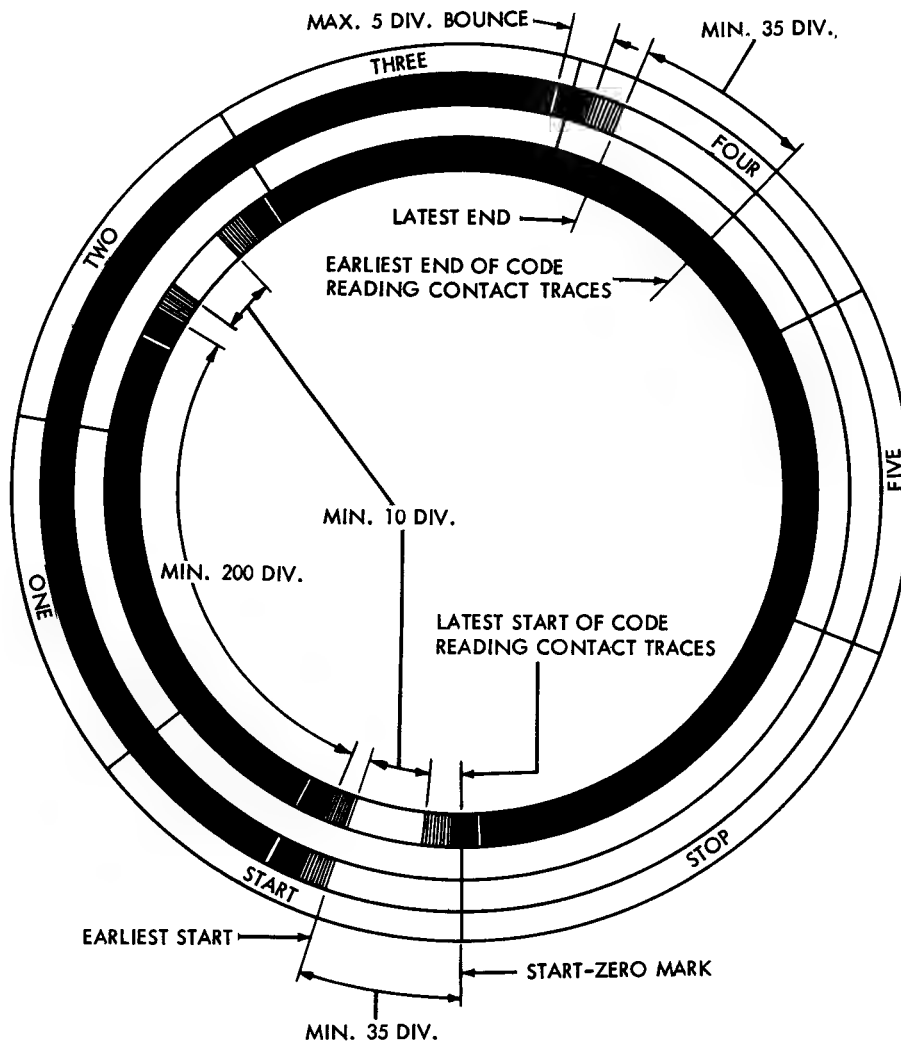
CODE READING CONTACTS

- (1) ZERO TEST SET AS PREVIOUSLY INSTRUCTED.
- (2) CONNECT NEON TRACE TO MARKING SIDE OF A CODE READING CONTACT (NORMALLY OPEN WHEN UNIT IS IN IDLE CONDITION). WITH UNIT RECEIVING LETTERS CODE COMBINATIONS, OBSERVE TRACE. REPEAT FOR ALL FIVE CONTACTS.
 - A. SIGNAL LENGTH FOR EACH CONTACT TRACE AND COMBINED CONTACT TRACES
 - MIN. 450 DIVISIONS
 - MAX. 594 DIVISIONS
 - B. BOUNCE SHOULD END WITHIN MAX. OF 20 DIVISIONS OF LATEST START AND EARLIEST END OF ALL TRACES.
- (3) TO ADJUST
 - A. IF REQUIREMENTS UNDER (2) A. ARE NOT MET, REFINE CONTACT BRACKET ADJUSTMENT. ATTEMPT TO ADJUST TOWARD MAXIMUM SIGNAL LENGTH.
 - B. IF BOUNCE REQUIREMENTS UNDER (2) B. ARE NOT MET, REFINE MARKING CONTACT SPRING AND SWINGER CONTACT SPRING TENSIONS.
 - C. IF ANY REFINEMENTS ARE NECESSARY, REPEAT COMPLETE TEST PROCEDURE.

FIGURE 48. SIGNAL DISTORTION TEST SET

NOTE:

TEST PROCEDURES ON THIS PAGE AND THE FOLLOWING PAGE APPLY ONLY TO 600 O.P.M. UNITS (WESTERN UNION PLAN 55 SYSTEM) USING ONE-CYCLE CAMS.

TIMING CONTACTS

(1) ZERO TEST SET AS PREVIOUSLY DESCRIBED.

(2) FRONT CONTACT

- A. CONNECT NEON TRACE TO RIGHT SIDE OF FRONT CONTACT (NORMALLY OPEN WHEN UNIT IS IN IDLE CONDITION). WITH UNIT RECEIVING CONTINUOUS LETTERS CODE COMBINATIONS, OBSERVE TRACE.

REQUIREMENTS

1. LATEST END MIN. OF 35 DIVISIONS BEFORE EARLIEST END OF CODE READING CONTACT TRACES.
2. EARLIEST START MIN. OF 35 DIVISIONS AFTER LATEST START OF CODE READING CONTACT TRACES.
3. MIN. TRACE LENGTH 200 DIVISIONS.
4. BOUNCE SHOULD END WITHIN MAX. 5 DIVISIONS OF LATEST START AND EARLIEST END OF ANY TRACE.

- B. RECORD LATEST START AND EARLIEST END OF TRACE.

- C. (APPLIES ONLY IF COMPLETE TRANSFER CONTACT IS USED). CONNECT NEON TRACE TO BOTH SIDES OF FRONT CONTACT. OBSERVE TRACE.

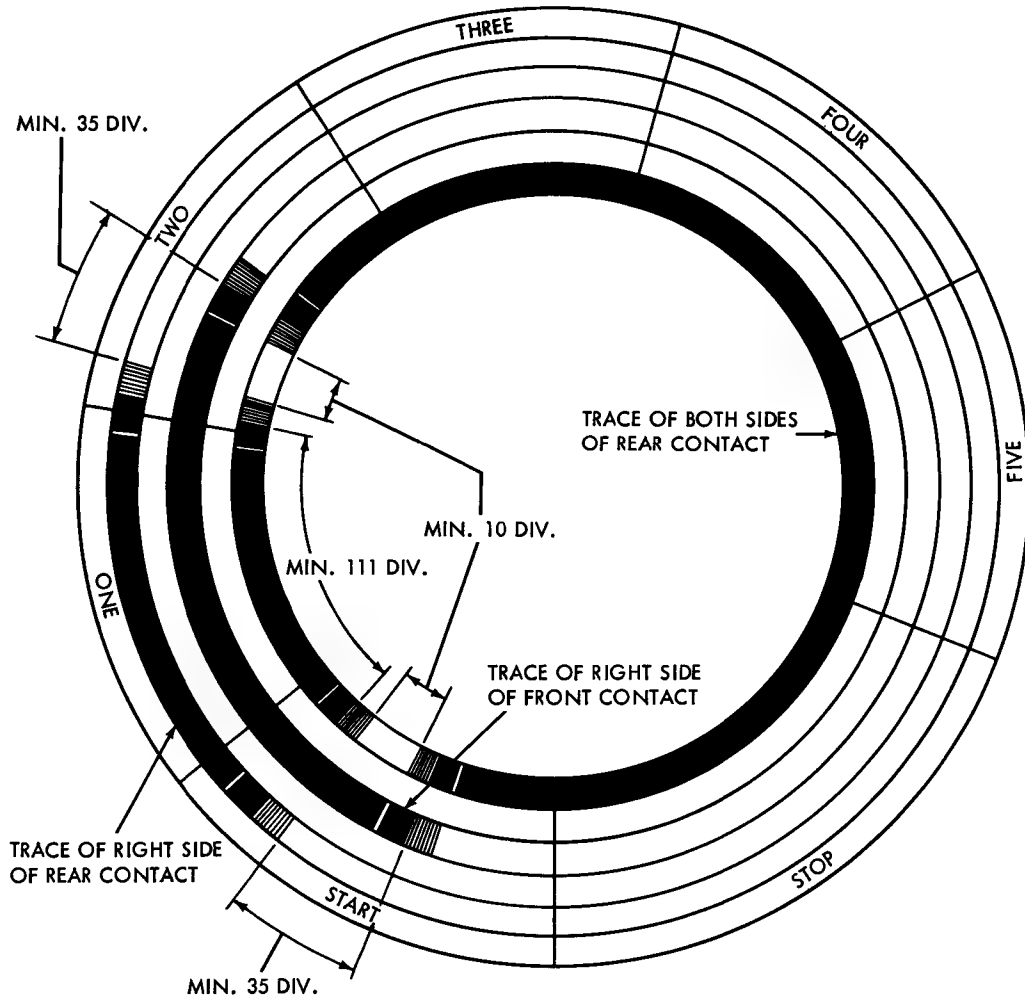
REQUIREMENT

1. BREAK IN TRACE AT TWO PLACES TO INDICATE BREAK BEFORE MAKE. MIN. 10 DIVISIONS

(TEST CONTINUED ON NEXT PAGE)

FIGURE 49. SIGNAL DISTORTION TEST SET.

TIMING CONTACTS CONT'D



(3) REAR CONTACT

- A. CONNECT NEON TRACE TO RIGHT SIDE OF REAR CONTACT (NORMALLY OPEN WHEN UNIT IS IN IDLE CONDITION). WITH UNIT RECEIVING LETTERS CODE COMBINATIONS, OBSERVE TRACE.

REQUIREMENTS

1. LATEST END OF TRACE MIN. OF 35 DIVISIONS BEFORE EARLIEST END OF TRACE OF RIGHT SIDE OF FRONT CONTACT RECORDED IN (2) B.
2. MIN. TRACE LENGTH 111 DIVISIONS.
3. EARLIEST START OF TRACE MIN. OF 35 DIVISIONS AFTER LATEST START OF TRACE OF RIGHT SIDE OF FRONT CONTACT RECORDED IN (2) B.
4. BOUNCE SHOULD END WITHIN MAX. 5 DIVISIONS OF LATEST START AND EARLIEST END OF ANY TRACE.

- B. (APPLIES ONLY IF COMPLETE TRANSFER CONTACT IS USED). CONNECT NEON TRACE TO BOTH SIDES OF REAR CONTACT. OBSERVE TRACE.

REQUIREMENTS

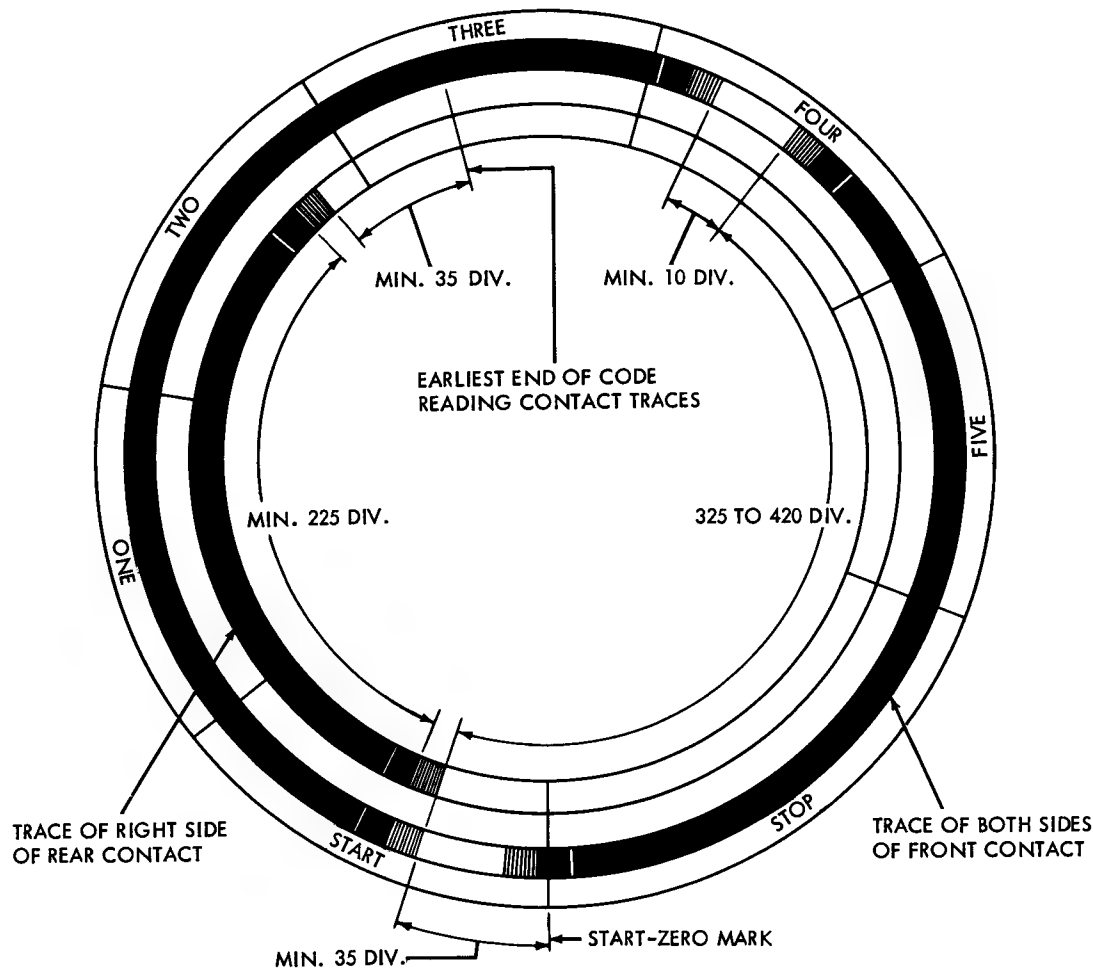
1. BREAK IN TRACE AT TWO PLACES TO INDICATE BREAK BEFORE MAKE. MIN. 10 DIVISIONS

(4) TO ADJUST

- A. IF TRACE LENGTHS UNDER (2) A. 3. AND (3) A. 2. ARE BOTH SHORT, REFINE CONTACT BRACKET ADJUSTMENT. IF ONLY ONE TRACE IS SHORT, REFINE CONTACT BACKSTOP ADJUSTMENT AND CHECK RIGHT CONTACT GAP, LEFT CONTACT GAP, SWINGER CONTACT SPRING, AND LEFT CONTACT SPRING ADJUSTMENTS.
- B. IF BREAK BEFORE MAKE REQUIREMENTS UNDER (2) C. 1. AND (3) B. 1. ARE NOT MET, REFINE RIGHT CONTACT GAP, LEFT CONTACT GAP, SWINGER CONTACT SPRING, AND LEFT CONTACT SPRING ADJUSTMENTS.
- C. IF ANY REFINEMENTS ARE NECESSARY, REPEAT COMPLETE TEST PROCEDURE.

FIGURE 50. SIGNAL DISTORTION TEST SET

TEST PROCEDURES ON THIS PAGE APPLY ONLY TO 600 O.P.M. UNITS (BELL 82B1 SYSTEM) USING ONE-CYCLE CAMS.



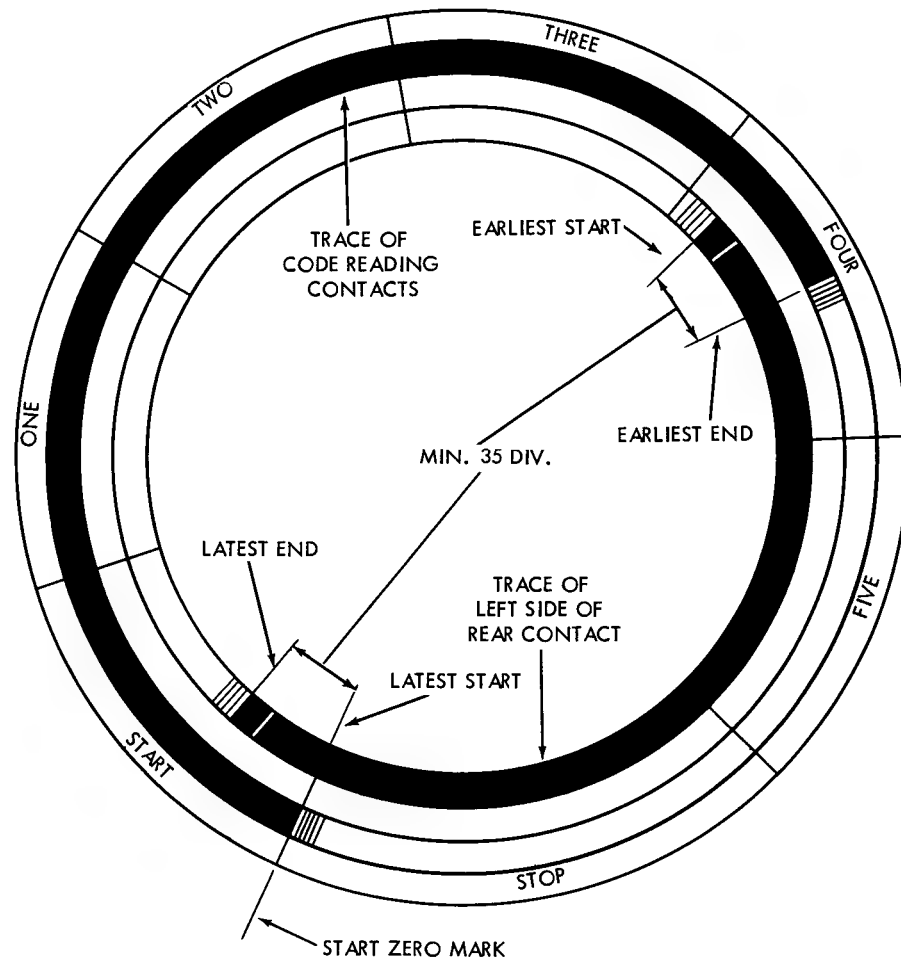
TIMING CONTACTS

- (1) ZERO TEST SET AS PREVIOUSLY DESCRIBED.
- (2) REAR CONTACT
 - A. CONNECT NEON TRACE TO RIGHT SIDE OF REAR CONTACT (NORMALLY OPEN WHEN UNIT IS IN IDLE CONDITION). WITH UNIT RECEIVING LETTERS CODE COMBINATIONS OBSERVE TRACE.
 1. EARLIEST START MIN. OF 35 DIVISIONS AFTER START ZERO MARK.
 2. LATEST END MIN. OF 35 DIVISIONS BEFORE EARLIEST END OF CODE READING CONTACT TRACES RECORDED WHEN ZEROING TEST SET.
 3. MIN. TRACE LENGTH 225 DIVISIONS.
 4. BOUNCE SHOULD END WITHIN MAX. 5 DIVISIONS OF START AND END OF ANY TRACE.
- (3) FRONT CONTACT
 - A. CONNECT NEON TRACE TO BOTH SIDES OF FRONT CONTACT. WITH UNIT RECEIVING LETTERS CODE COMBINATIONS, OBSERVE TRACE.
 1. BREAK IN TRACE TO INDICATE BREAK BEFORE MAKE.
 - MIN. 10 DIVISIONS
 2. BETWEEN EARLIEST STARTS OF TRACES OF RIGHT AND LEFT (NORMALLY OPEN AND NORMALLY CLOSED) SIDES OF CONTACT.
 - MIN. 325 DIVISIONS---MAX. 420 DIVISIONS
 3. BOUNCE SHOULD END WITHIN MAX. 5 DIVISIONS OF LATEST START AND EARLIEST END OF ANY TRACE.
- (4) TO ADJUST
 - A. IF TIMING REQUIREMENTS UNDER (2) A. 1., 2., 3., AND (3) A. 1. AND 2. ARE NOT MET, REFINE CONTACT BRACKET ADJUSTMENT AND/OR RIGHT CONTACT GAP, LEFT CONTACT GAP, SWINGER CONTACT SPRING, AND LEFT CONTACT SPRING ADJUSTMENTS.
 - B. IF BOUNCE REQUIREMENTS UNDER (2) A. 4. AND (3) A. 3. ARE NOT MET, REFINE SWINGER CONTACT SPRING AND LEFT CONTACT SPRING TENSIONS.
 - C. IF ANY REFINEMENTS ARE NECESSARY REPEAT COMPLETE TEST PROCEDURE.

FIGURE 51. SIGNAL DISTORTION TEST SET

NOTE

TEST PROCEDURES ON THIS PAGE APPLY ONLY TO 600 O.P.M. UNITS (FAA ADIS) USING ONE-CYCLE CAMS.



TIMING CONTACTS

(1) ZERO TEST SET AS PREVIOUSLY DESCRIBED.

(2) REAR CONTACT

A. CONNECT NEON TRACE TO LEFT SIDE OF REAR CONTACT (NORMALLY CLOSED WHEN UNIT IS IN IDLE CONDITION). WITH UNIT RECEIVING LETTERS CODE COMBINATION OBSERVE TRACE.

REQUIREMENTS

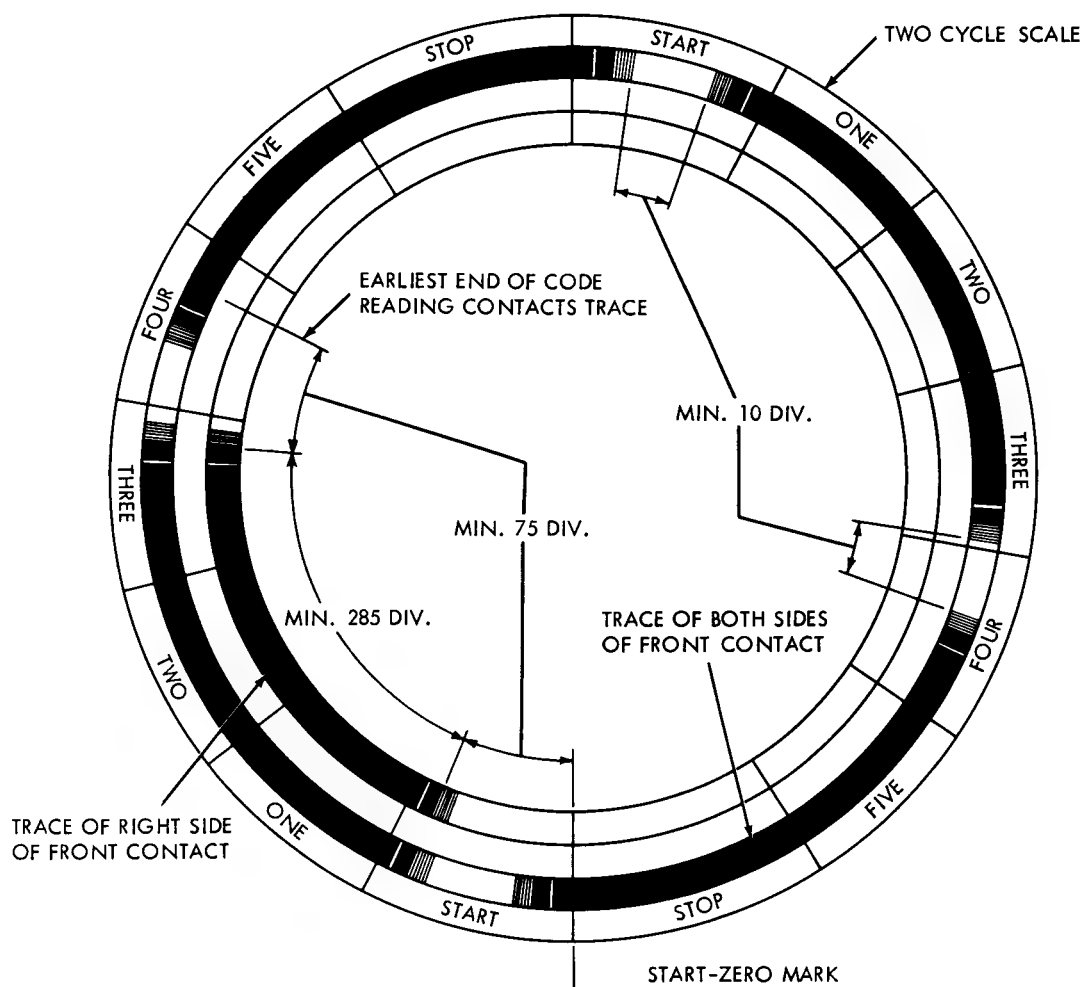
1. EARLIEST START MIN. OF 35 DIVISIONS BEFORE EARLIEST END OF ALL CODE READING CONTACTS.
2. LATEST END MIN. OF 35 DIVISIONS AFTER THE LATEST START OF ALL CODE READING CONTACTS.
3. BOUNCE SHOULD END WITHIN MAX. 10 DIVISIONS OF START AND END OF ANY TRACE.

(3) TO ADJUST

- A. IF TIMING REQUIREMENTS UNDER (2) A. 1. AND 2. ARE NOT MET, REFINE CONTACT BRACKET ADJUSTMENT AND/OR RIGHT CONTACT GAP, LEFT CONTACT GAP, SWINGER CONTACT SPRING AND LEFT CONTACT SPRING ADJUSTMENTS.
- B. IF BOUNCE REQUIREMENTS UNDER (2) A. 3. ARE NOT MET, REFINE SWINGER CONTACT SPRING AND LEFT CONTACT SPRING TENSIONS.
- C. IF ANY REFINEMENTS ARE NECESSARY REPEAT COMPLETE TEST PROCEDURE.

FIGURE 52. SIGNAL DISTORTION TEST SET

NOTE
TEST PROCEDURES ON THIS PAGE AND THE FOLLOWING PAGE
APPLY TO 1200 O.P.M. UNITS ONLY.



TIMING CONTACTS

(1) ZERO TEST SET AS PREVIOUSLY DESCRIBED.

(2) FRONT CONTACT

A. CONNECT NEON TRACE TO RIGHT SIDE OF FRONT CONTACT (NORMALLY OPEN WHEN UNIT IS IN IDLE CONDITION). WITH UNIT RECEIVING LETTERS CODE COMBINATIONS, OBSERVE TRACE.

REQUIREMENTS

1. EARLIEST START MIN. 75 DIVISIONS AFTER START-ZERO MARK.
2. LATEST END MIN. 75 DIVISIONS BEFORE EARLIEST END OF CODE READING CONTACTS RECORDED WHEN ZEROING TEST SET.
3. SHORTEST TRACE LENGTH MIN. OF 285 DIVISIONS.
4. BOUNCE SHOULD END WITHIN MAX. OF 10 DIVISIONS OF EARLIEST START AND LATEST END OF ANY TRACE.

B. CONNECT NEON TRACE TO BOTH SIDES OF FRONT CONTACT. WITH UNIT RECEIVING LETTERS CODE COMBINATIONS, OBSERVE TRACE.

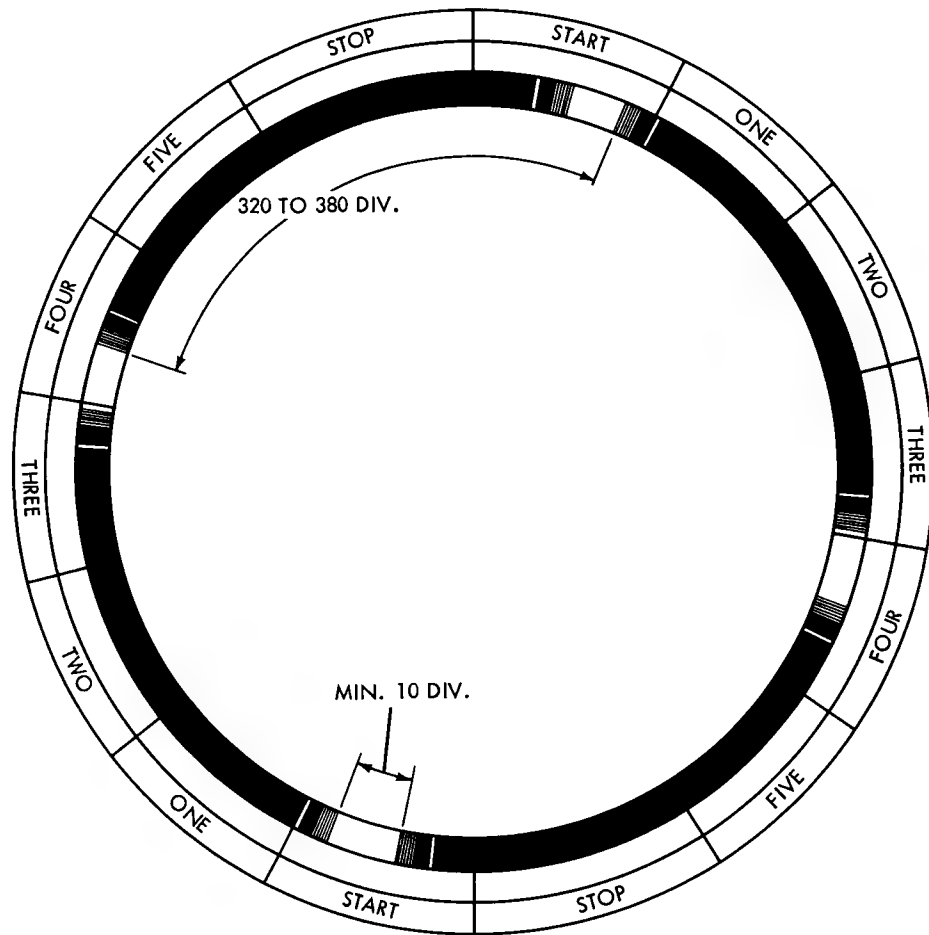
REQUIREMENT

1. MIN. 10 DIVISION BREAK IN TRACE AT FOUR PLACES TO INDICATE BREAK BEFORE MAKE.

TEST CONTINUED ON NEXT PAGE.

FIGURE 53. SIGNAL DISTORTION TEST SET

TIMING CONTACTS CONT'D



(3) REAR CONTACT

- A. CONNECT NEON TRACE TO BOTH SIDES OF REAR CONTACT. WITH UNIT RECEIVING LETTERS CODE COMBINATIONS, OBSERVE TRACE. REQUIREMENTS

1. MIN. 10 DIVISION BREAK IN TRACE AT FOUR PLACES TO INDICATE BREAK BEFORE MAKE.
2. BETWEEN EARLIEST START OF ANY NORMALLY OPEN CONTACT TRACE TO EARLIEST START OF NEXT NORMALLY CLOSED CONTACT TRACE.
MIN. 320 DIVISIONS
MAX. 380 DIVISIONS

(4) TO ADJUST

- A. IF TRACE LENGTHS UNDER (2) A. 3. AND (3) A. 2. ARE BOTH TOO SHORT, REFINE CONTACT BRACKET ADJUSTMENT. IF TRACE LENGTH UNDER (2) A. 3. ONLY IS SHORT, REFINE CONTACT BACKSTOP ADJUSTMENT AND RECHECK TRACE LENGTH IN (3) A. 2.
- B. IF TIMING REQUIREMENTS UNDER (2) A. 1. AND (2) A. 2. ARE NOT MET, REFINE TRACE LENGTH AS IN (4) A. ABOVE, AND/OR RIGHT CONTACT GAP, LEFT CONTACT GAP, SWINGER CONTACT SPRING, AND LEFT CONTACT SPRING ADJUSTMENTS.
- C. IF BREAK BEFORE MAKE REQUIREMENTS UNDER (2) B. 1. AND (3) A. 1. ARE NOT MET, REFINE RIGHT CONTACT GAP, LEFT CONTACT GAP, SWINGER CONTACT SPRING, AND LEFT CONTACT SPRING.
- D. IF BOUNCE REQUIREMENTS UNDER (2) A. 4. ARE NOT MET, REFINE SWINGER CONTACT SPRING AND LEFT CONTACT SPRING TENSIONS.
- E. IF ANY REFINEMENTS ARE NECESSARY, REPEAT COMPLETE TEST PROCEDURE.

FIGURE 54. SIGNAL DISTORTION TEST SET

b. REPERFORATOR BASE

TAPE-OUT LEVERREQUIREMENT

TAPE-OUT LEVER SHOULD BE ABLE TO PUSH BOTH SWITCH LEVERS AWAY FROM SWITCH ACTUATORS BUT SHOULD NOT BE ABLE TO LIFT WOOD FILLER WITH DEPLETED TAPE ROLL OUT OF SLOTS IN TAPE CONTAINER.

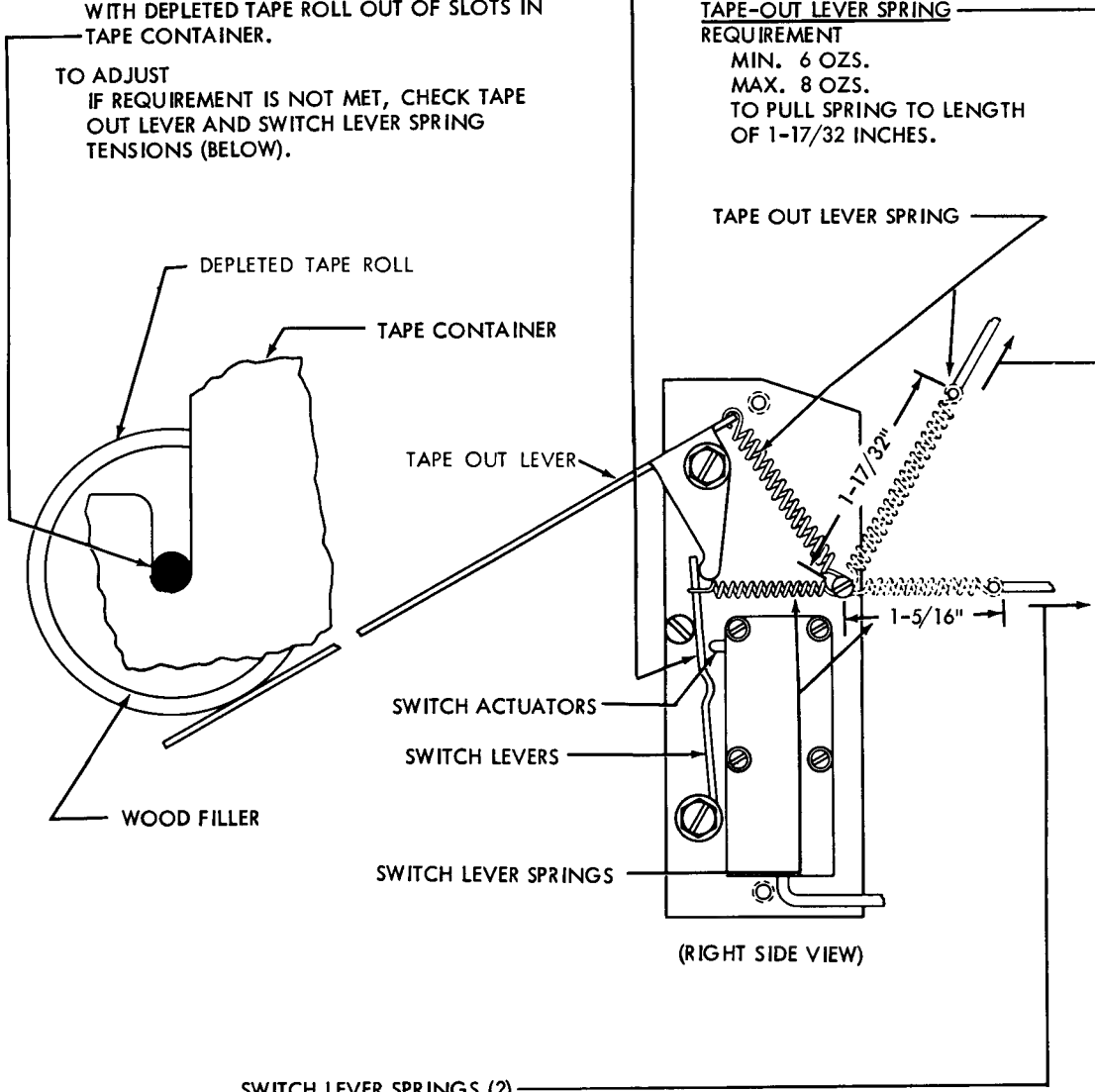
TO ADJUST
IF REQUIREMENT IS NOT MET, CHECK TAPE
OUT LEVER AND SWITCH LEVER SPRING
TENSIONS (BELOW).

TAPE-OUT LEVER SPRINGREQUIREMENT

MIN. 6 OZS.

MAX. 8 OZS.

TO PULL SPRING TO LENGTH
OF $1-17/32$ INCHES.

SWITCH LEVER SPRINGS (2)REQUIREMENT

MIN. $1-3/4$ OZS.

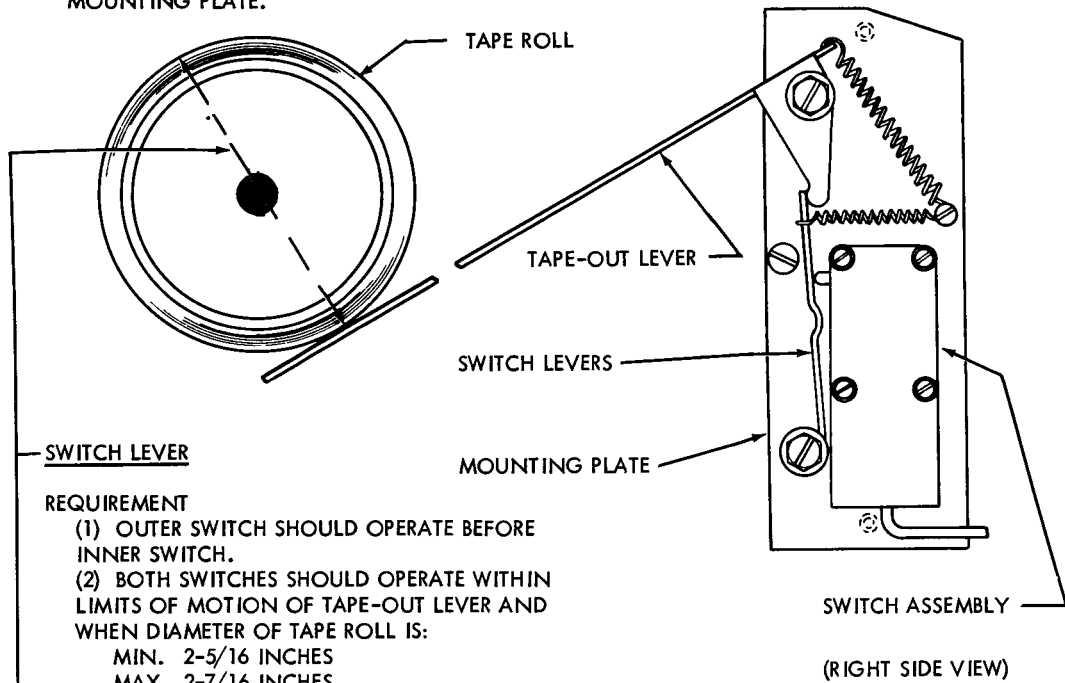
MAX. $2-1/4$ OZS.

TO PULL SPRING TO LENGTH
OF $1-5/16$ INCHES.

FIGURE 55. TAPE OUT MECHANISM

NOTE:

THE INNER ELEMENTS ARE THOSE NEARER THE MOUNTING PLATE, THE OUTER ELEMENTS, THOSE FARTHER FROM THE MOUNTING PLATE.



REQUIREMENT

- (1) OUTER SWITCH SHOULD OPERATE BEFORE INNER SWITCH.
- (2) BOTH SWITCHES SHOULD OPERATE WITHIN LIMITS OF MOTION OF TAPE-OUT LEVER AND WHEN DIAMETER OF TAPE ROLL IS:
MIN. 2-5/16 INCHES
MAX. 2-7/16 INCHES

TO ADJUST

BEND OUTER SWITCH LEVER TOWARD SWITCH ASSEMBLY.

NOTE:

ADJUSTMENT CAN BE FACILITATED BY REMOVING SWITCH MECHANISM FROM TAPE CONTAINER.

SWITCH MECHANISM MOUNTING PLATE

REQUIREMENT

OUTER SWITCH SHOULD JUST OPERATE WHEN DIAMETER OF TAPE ROLL IS REDUCED TO APPROXIMATELY 2-3/8 INCHES.

TO ADJUST

POSITION MOUNTING PLATE WITH MOUNTING SCREWS LOOSENED.

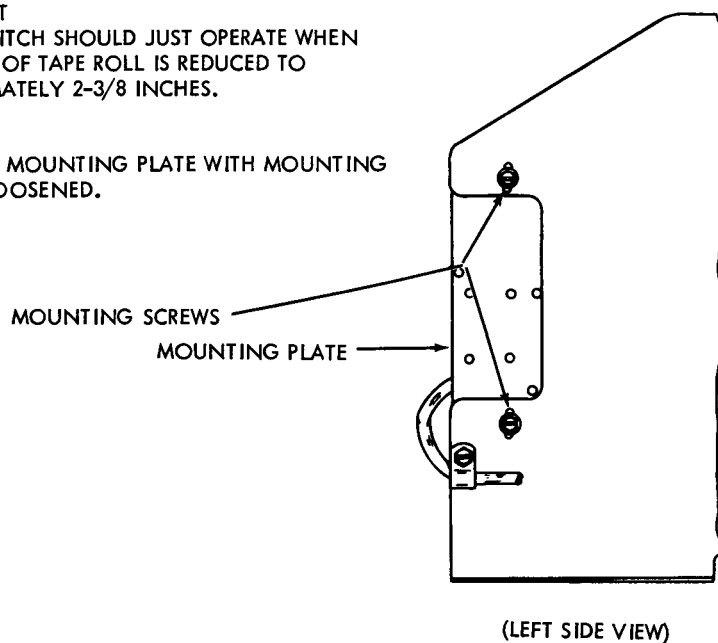


FIGURE 56. TAPE OUT MECHANISM

TIMING BELTREQUIREMENT

SLIGHT PRESSURE (8 ± 1 OZ.) AT CENTER
OF SPAN SHOULD DEFLECT BELT:

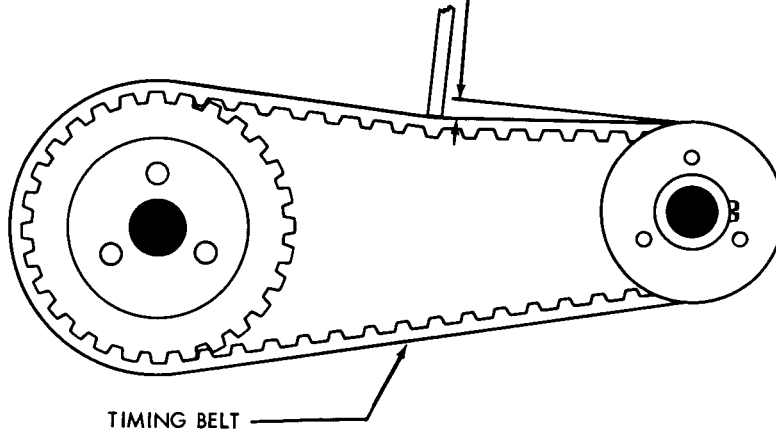
MIN. $3/32$ INCH

MAX. $5/32$ INCH

CAUTION: BELT SHOULD NOT BE TIGHT.

TO ADJUST

POSITION INTERMEDIATE DRIVE ASSEMBLY WITH
MOUNTING SCREWS LOOSENED.

WIRE TAPE GUIDEREQUIREMENT

TAPE SHOULD PASS FREELY THROUGH
WIRE GUIDE AND BE ALIGNED WITH
PERFORATOR GUIDE ASSEMBLY.

TO ADJUST

BEND OR POSITION WIRE GUIDE

GEAR MESHREQUIREMENT

MOTOR DRIVE GEAR AND INTERMEDIATE
SHAFT DRIVEN GEAR SHOULD MESH AT
RIGHT ANGLES.

TO ADJUST

POSITION DRIVE ASSEMBLY WITH
MOUNTING SCREWS LOOSENED. RE-
CHECK TIMING BELT ADJUSTMENT (ABOVE).

INTERMEDIATE DRIVE ASSEMBLY

MOUNTING SCREWS

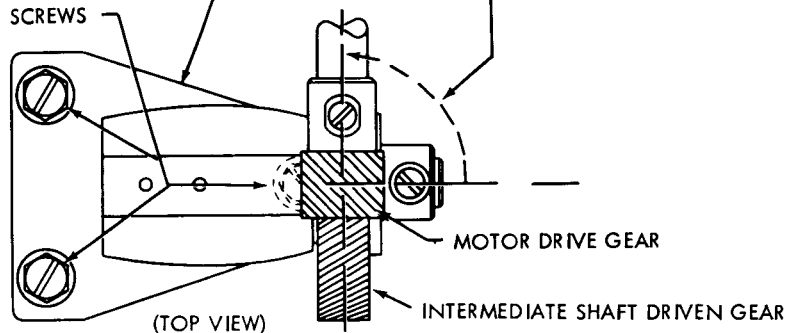
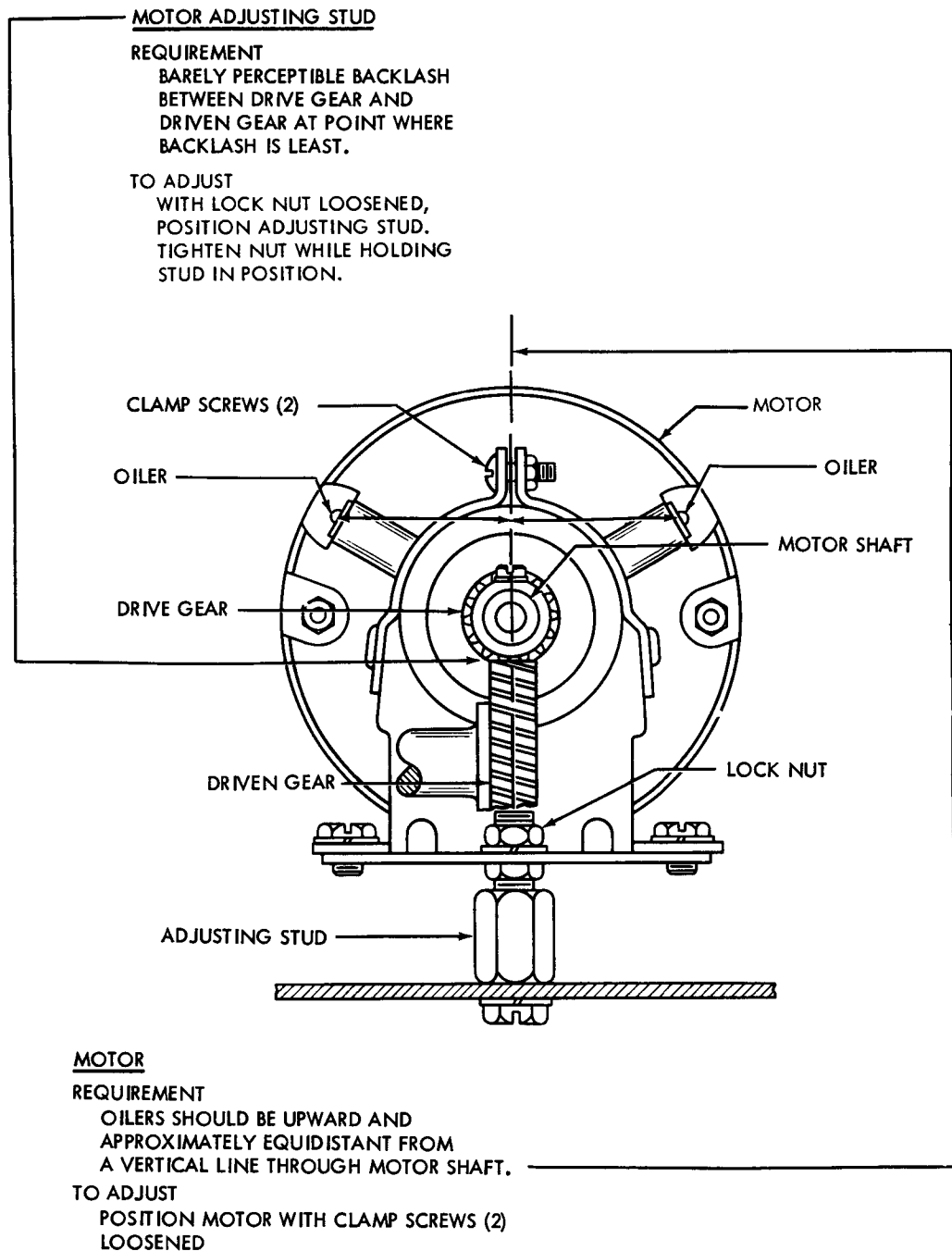


FIGURE 57. INTERMEDIATE DRIVE PARTS

c. MOTOR UNIT

CAUTION:

IF MOTOR BECOMES BLOCKED FOR SEVERAL SECONDS, THERMAL CUT-OUT SWITCH WILL BREAK CIRCUIT. SHOULD THIS HAPPEN, ALLOW MOTOR TO COOL AT LEAST 5 MINUTES BEFORE DEPRESSING RED RESET BUTTON.

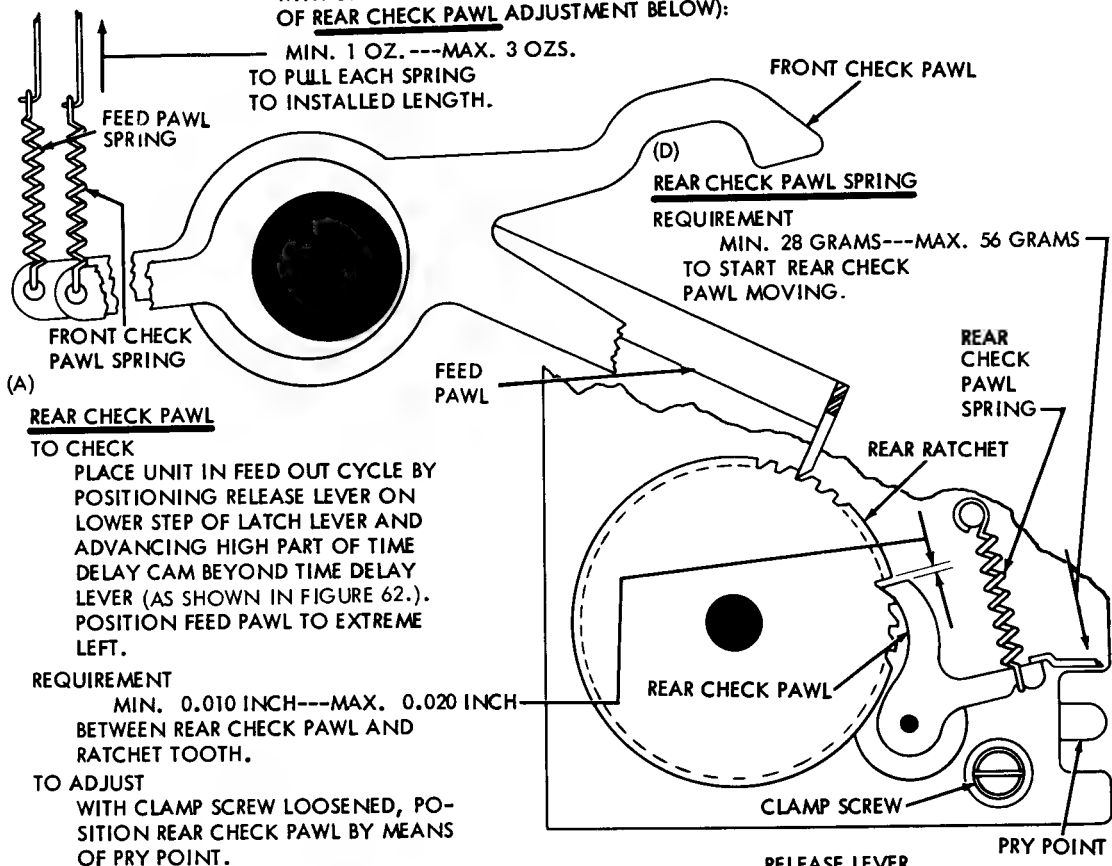
FIGURE 58. MOTOR UNIT



(C) FEED PAWL AND FRONT CHECK PAWL SPRINGS**REQUIREMENT**

WITH UNIT IN FEED OUT CYCLE (SEE "TO CHECK" OF REAR CHECK PAWL ADJUSTMENT BELOW):

MIN. 1 OZ. --- MAX. 3 OZS.
TO PULL EACH SPRING
TO INSTALLED LENGTH.

**(A) REAR CHECK PAWL****TO CHECK**

PLACE UNIT IN FEED OUT CYCLE BY POSITIONING RELEASE LEVER ON LOWER STEP OF LATCH LEVER AND ADVANCING HIGH PART OF TIME DELAY CAM BEYOND TIME DELAY LEVER (AS SHOWN IN FIGURE 62.). POSITION FEED PAWL TO EXTREME LEFT.

REQUIREMENT

MIN. 0.010 INCH --- MAX. 0.020 INCH
BETWEEN REAR CHECK PAWL AND
RATCHET TOOTH.

TO ADJUST

WITH CLAMP SCREW LOOSENED, POSITION REAR CHECK PAWL BY MEANS OF PRY POINT.

(B) RATCHET STOP BLOCK**TO CHECK**

WITH UNIT IN STOP POSITION, PLACE RELEASE LEVER ON LOWER STEP OF LATCH LEVER. PERMIT STOP ON FRONT RATCHET TO REST AGAINST STOP BLOCK. ROTATE MAIN SHAFT UNTIL FEED PAWL IS IN EXTREME RIGHT POSITION.

REQUIREMENT

MIN. 0.002 INCH --- MAX. 0.010 INCH
BETWEEN FRONT CHECK PAWL AND
FRONT RATCHET TOOTH.

TO ADJUST

WITH TWO CLAMP SCREWS LOOSENED POSITION STOP BLOCK BY MEANS OF PRY POINT.

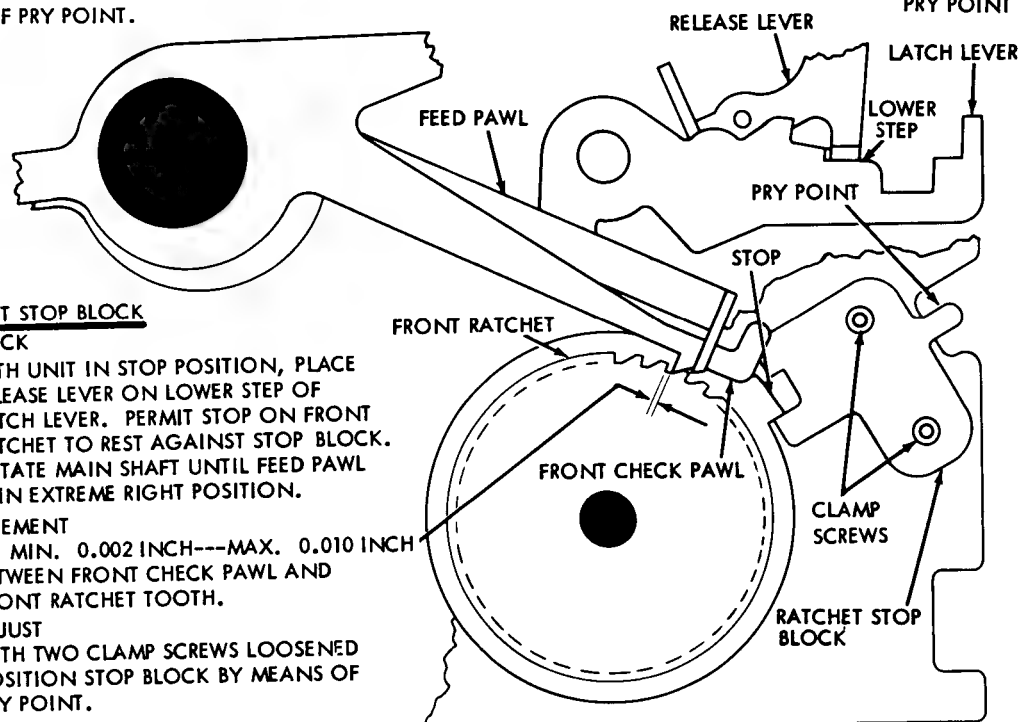


FIGURE 60. AUTOMATIC NON-INTERFERING LETTERS TAPE FEED OUT MECHANISM

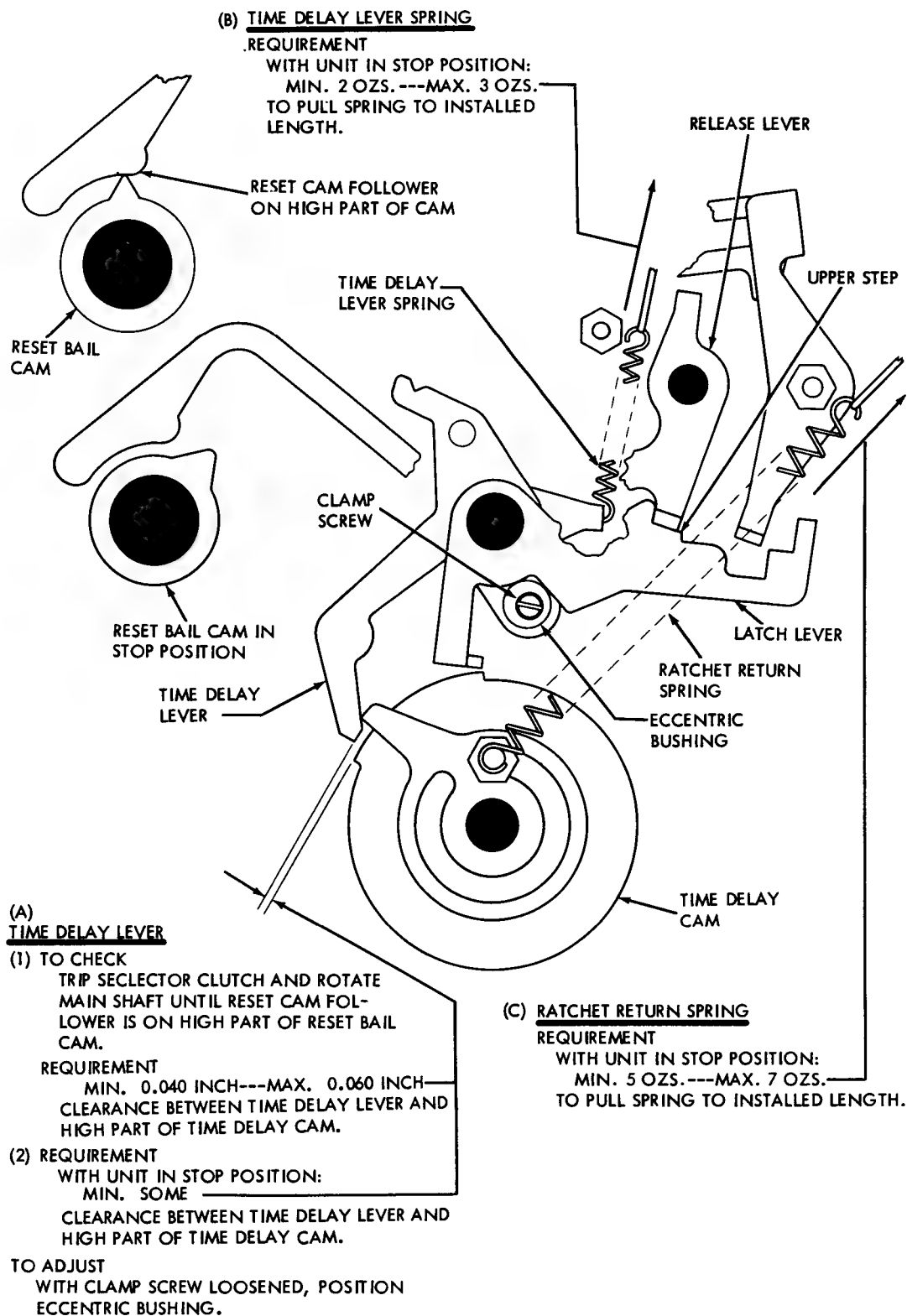


FIGURE 61.. AUTOMATIC NON-INTERFERING LETTERS TAPE FEED OUT MECHANISM

RELEASE ARM**TO CHECK**

PLACE UNIT IN FEED OUT CYCLE BY POSITIONING RELEASE LEVER ON LOWER STEP OF LATCH LEVER. ADVANCE RATCHETS BEYOND TIME DELAY (HIGH PART OF TIME DELAY CAM BEYOND TIME DELAY LEVER). POSITION FEED OUT CAM AS SHOWN.

REQUIREMENT

MIN. 0.010 INCH---MAX. 0.025 INCH BETWEEN DRIVE ARM AND RELEASE ARM.

TO ADJUST

WITH CLAMP NUT LOOSENED, POSITION RELEASE ARM BY MEANS OF ECCENTRIC SCREW ON TIME DELAY LEVER.

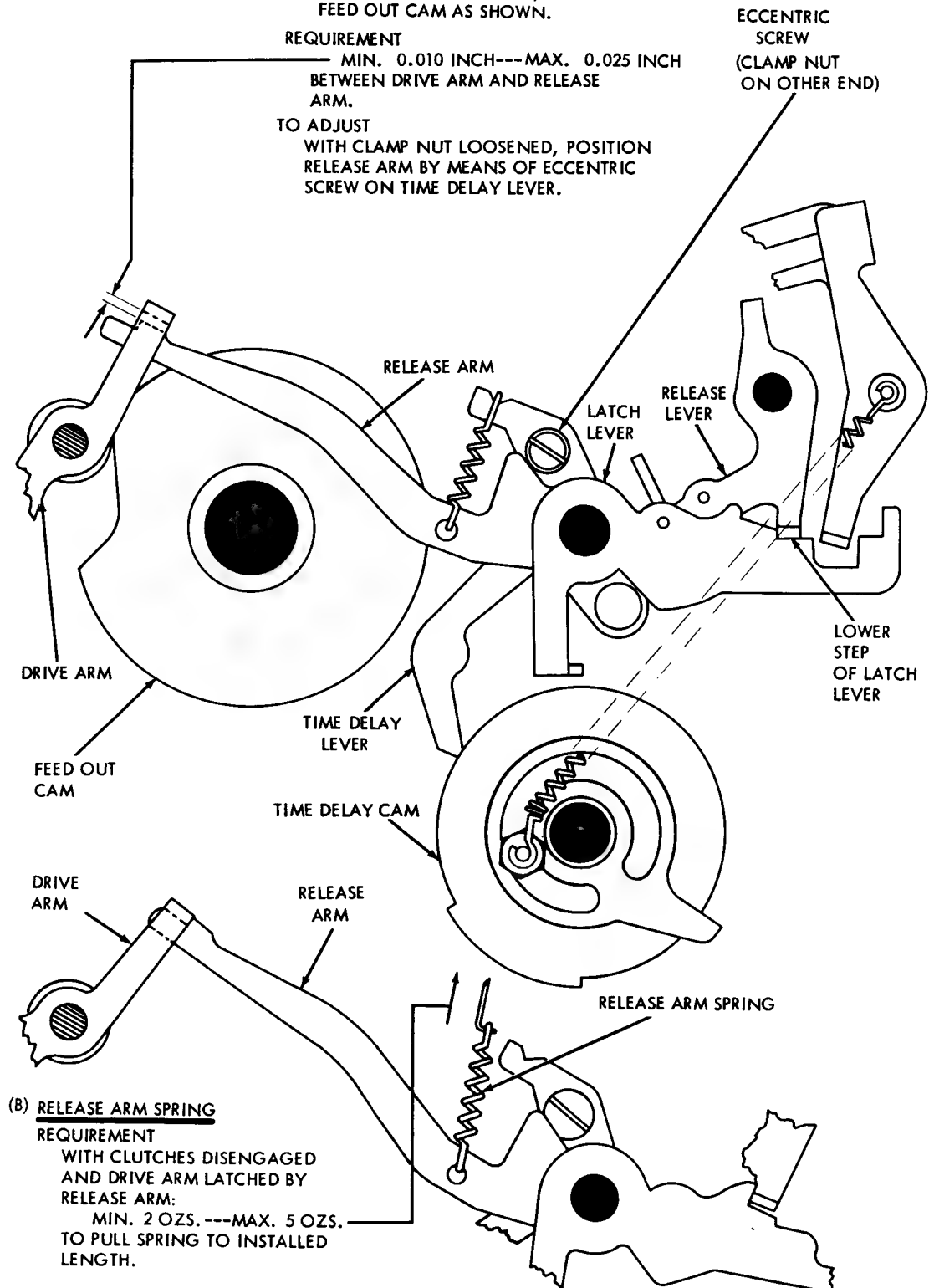


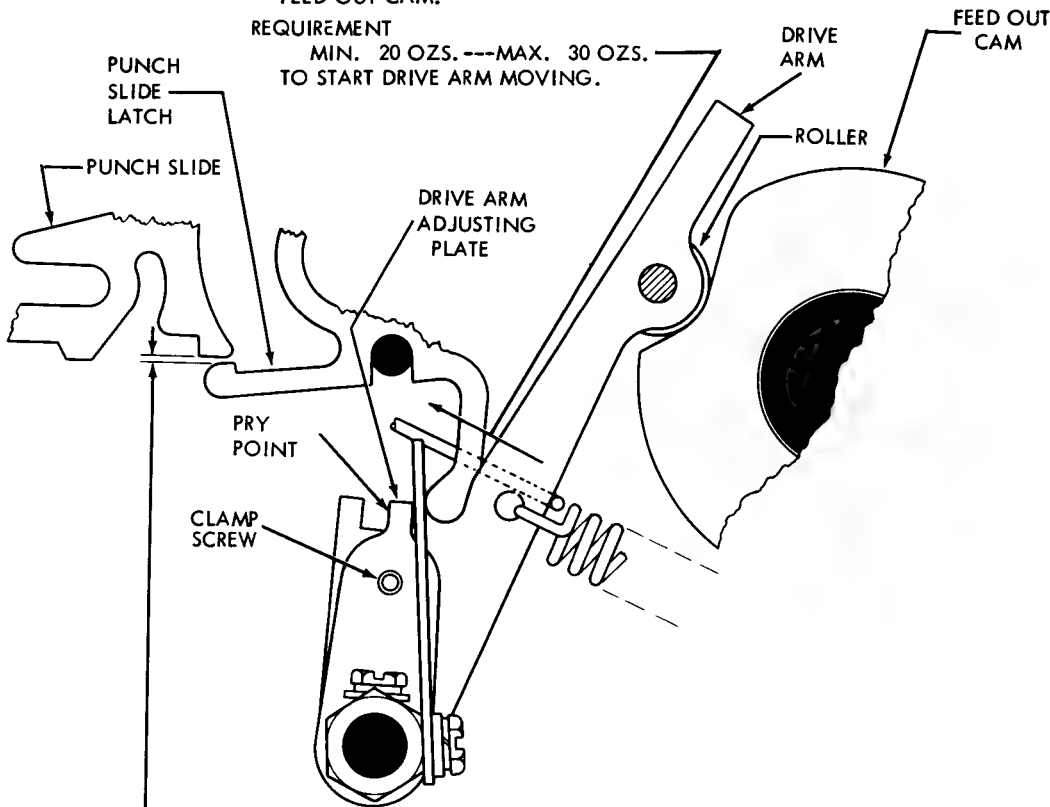
FIGURE 62. AUTOMATIC NON-INTERFERING LETTERS TAPE FEED OUT MECHANISM

(A) DRIVE ARM SPRING

PLACE UNIT IN FEED OUT CYCLE BY POSITIONING RELEASE LEVER ON LOWER STEP OF LATCH LEVER AND ADVANCING HIGH PART OF TIME DELAY CAM BEYOND TIME DELAY LEVER (AS SHOWN IN FIGURE 62) ROTATE MAIN SHAFT UNTIL DRIVE ARM ROLLER IS ON LOW PART OF FEED OUT CAM.

REQUIREMENT

MIN. 20 OZS. ---MAX. 30 OZS. TO START DRIVE ARM MOVING.

**(B)****DRIVE ARM ADJUSTING PLATE****TO CHECK**

SET UP BLANK CODE COMBINATION (-----) IN SELECTOR. PLACE UNIT IN FEED OUT CYCLE BY POSITIONING RELEASE LEVER ON LOWER STEP OF LATCH LEVER AND ADVANCING HIGH PART OF TIME DELAY CAM BEYOND TIME DELAY LEVER (AS SHOWN IN FIGURE 62.). ROTATE MAIN SHAFT UNTIL DRIVE ARM ROLLER IS ON LOW PART OF FEED OUT CAM. MAKE SURE THAT RESET BAIL IS IN LOWER POSITION.

REQUIREMENT

MIN. 0.010 INCH ---MAX. 0.030 INCH BETWEEN PUNCH SLIDE AND PUNCH SLIDE LATCH AT SLIDE WHERE CLEARANCE IS LEAST.

TO ADJUST

WITH CLAMP SCREW LOOSENED, POSITION DRIVE ARM ADJUSTING PLATE BY MEANS OF PRY POINT.

FIGURE 63. AUTOMATIC NON-INTERFERING LETTERS TAPE FEED OUT MECHANISM

(B)
ADJUSTING LEVER

TO CHECK

PLACE UNIT IN FEED OUT CYCLE BY POSITIONING RELEASE LEVER ON LOWER STEP OF LATCH LEVER AND ADVANCING HIGH PART OF TIME DELAY CAM BEYOND TIME DELAY LEVER (AS SHOWN IN FIGURE 62.). POSITION MAIN SHAFT SO THAT DRIVE ARM ROLLER IS ON LOW PART OF FEED OUT CAM.

REQUIREMENT

- (1) MIN. 0.010 INCH---MAX. 0.030 INCH BETWEEN RELEASE AND MAIN TRIP LEVER.
- (2) SOME CLEARANCE BETWEEN MAIN TRIP LEVER AND DOWNSTOP BRACKET.

TO ADJUST

WITH CLAMP SCREW LOOSENED, POSITION ADJUSTING LEVER BY MEANS OF PRY POINT.

(A) **FOLLOWER LEVER**

REQUIREMENT

WITH FOLLOWER LEVER ON HIGH PART OF TRIP CAM:

- (1) MIN. 0.010 INCH---MAX. 0.030 INCH BETWEEN RELEASE AND MAIN TRIP LEVER.
- (2) SOME CLEARANCE BETWEEN MAIN TRIP LEVER AND DOWNSTOP BRACKET.

TO ADJUST

WITH LOCK NUT LOOSENED, POSITION ADJUSTING ARM BY MEANS OF PRY POINT.

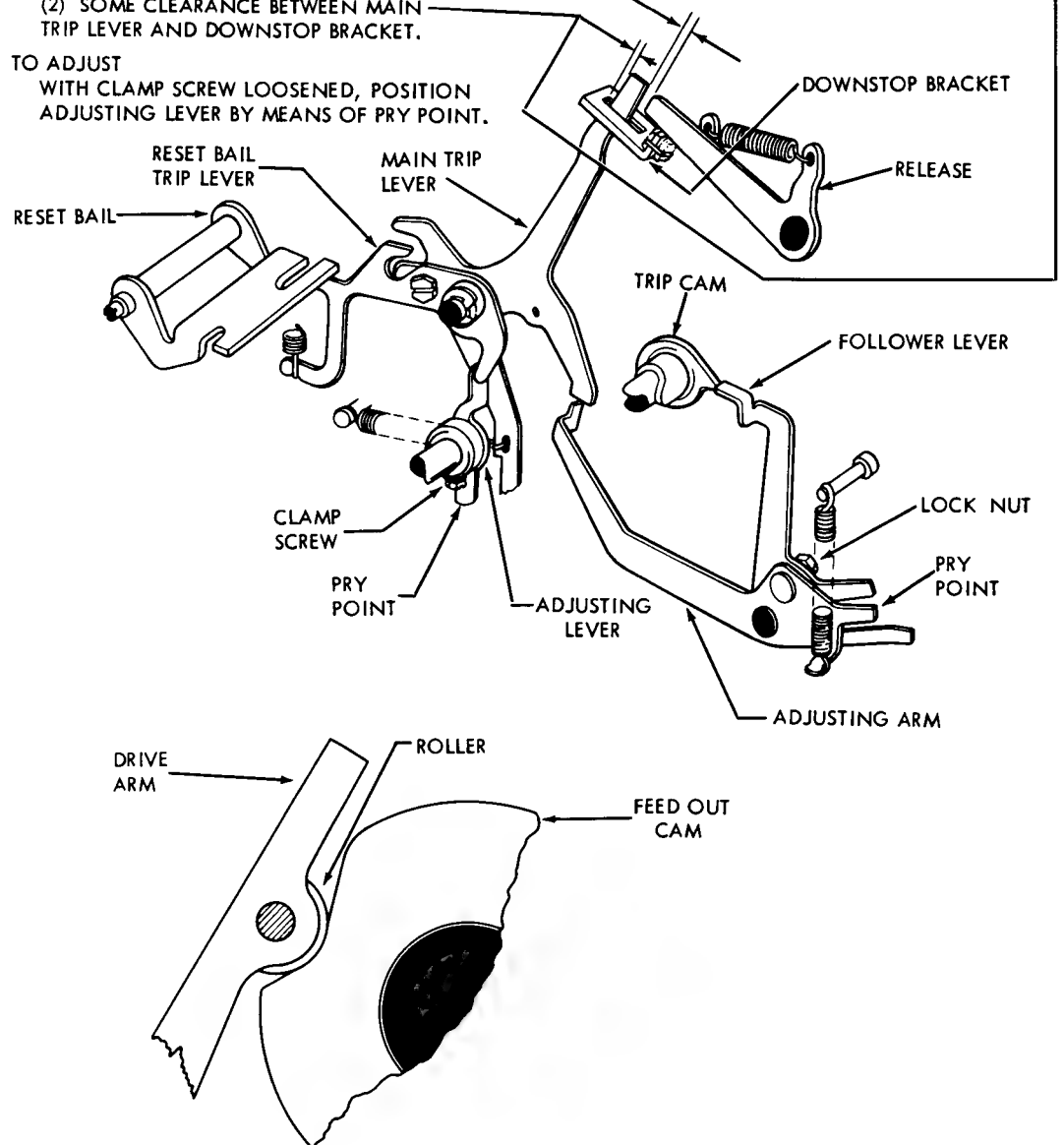


FIGURE 64. AUTOMATIC NON-INTERFERING LETTERS TAPE FEED OUT MECHANISM

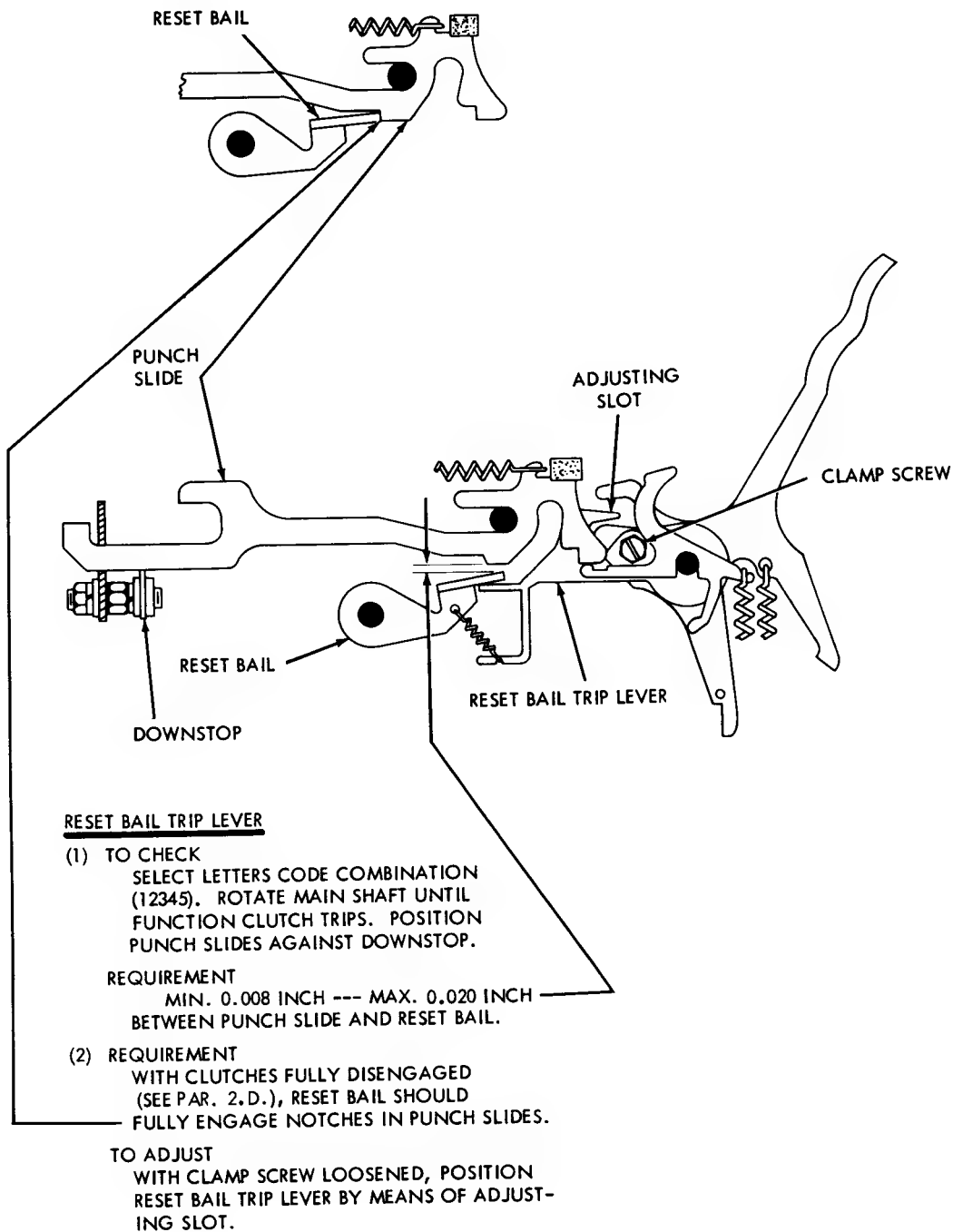
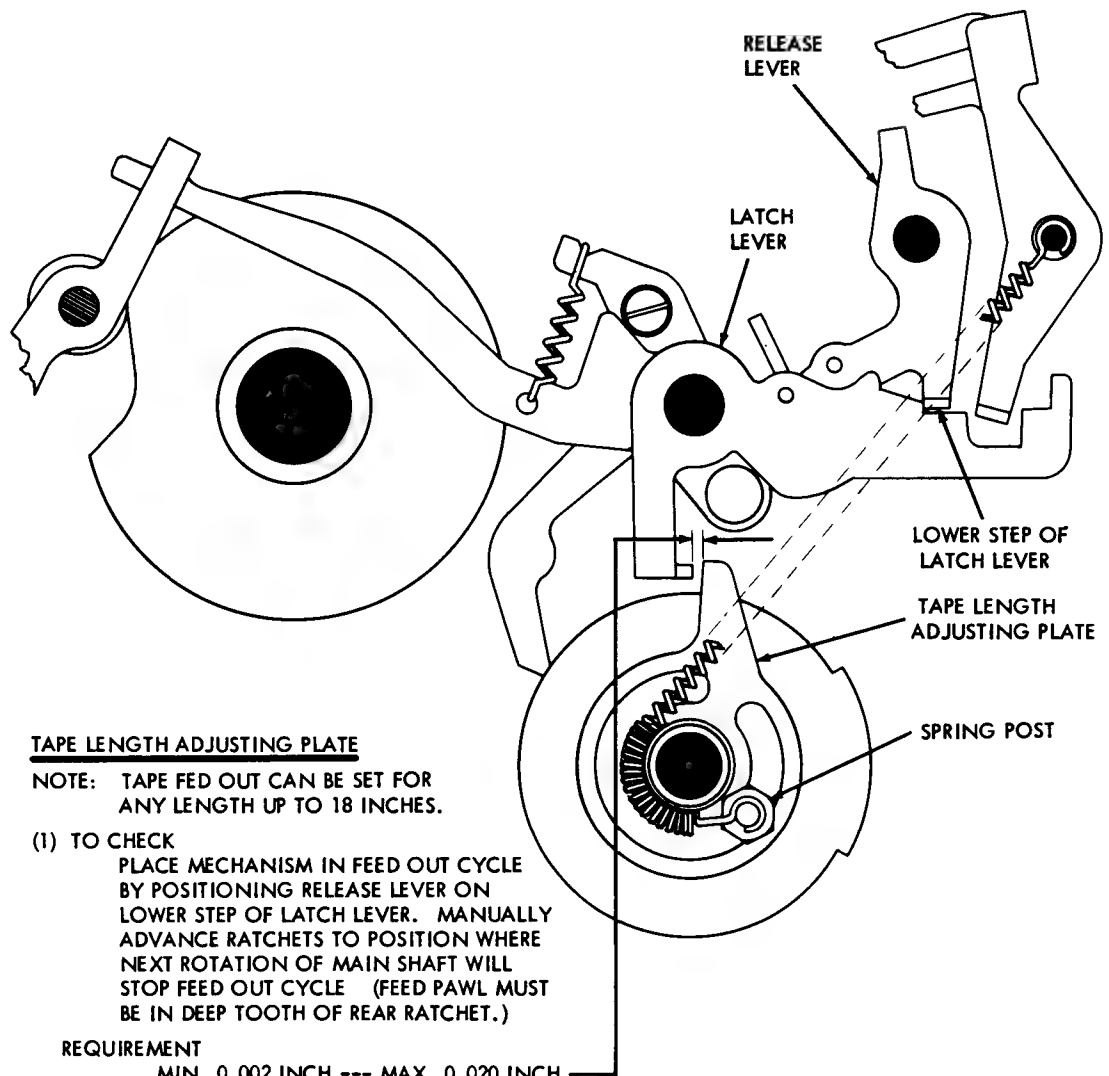


FIGURE 65. AUTOMATIC NON-INTERFERING TAPE FEED OUT MECHANISM



TAPE LENGTH ADJUSTING PLATE

NOTE: TAPE FED OUT CAN BE SET FOR ANY LENGTH UP TO 18 INCHES.

- (1) TO CHECK
PLACE MECHANISM IN FEED OUT CYCLE BY POSITIONING RELEASE LEVER ON LOWER STEP OF LATCH LEVER. MANUALLY ADVANCE RATCHETS TO POSITION WHERE NEXT ROTATION OF MAIN SHAFT WILL STOP FEED OUT CYCLE (FEED PAWL MUST BE IN DEEP TOOTH OF REAR RATCHET.)

REQUIREMENT

MIN. 0.002 INCH --- MAX. 0.020 INCH
BETWEEN ADJUSTING PLATE AND LATCH LEVER.

- (2) REQUIREMENT
WHEN OPERATING UNDER POWER, UNIT SHOULD FEED OUT CORRECT LENGTH OF TAPE.

TO ADJUST

WITH SPRING POST LOOSENED, POSITION ADJUSTING PLATE.

FIGURE 66. AUTOMATIC NON-INTERFERING LETTERS TAPE FEED OUT MECHANISM

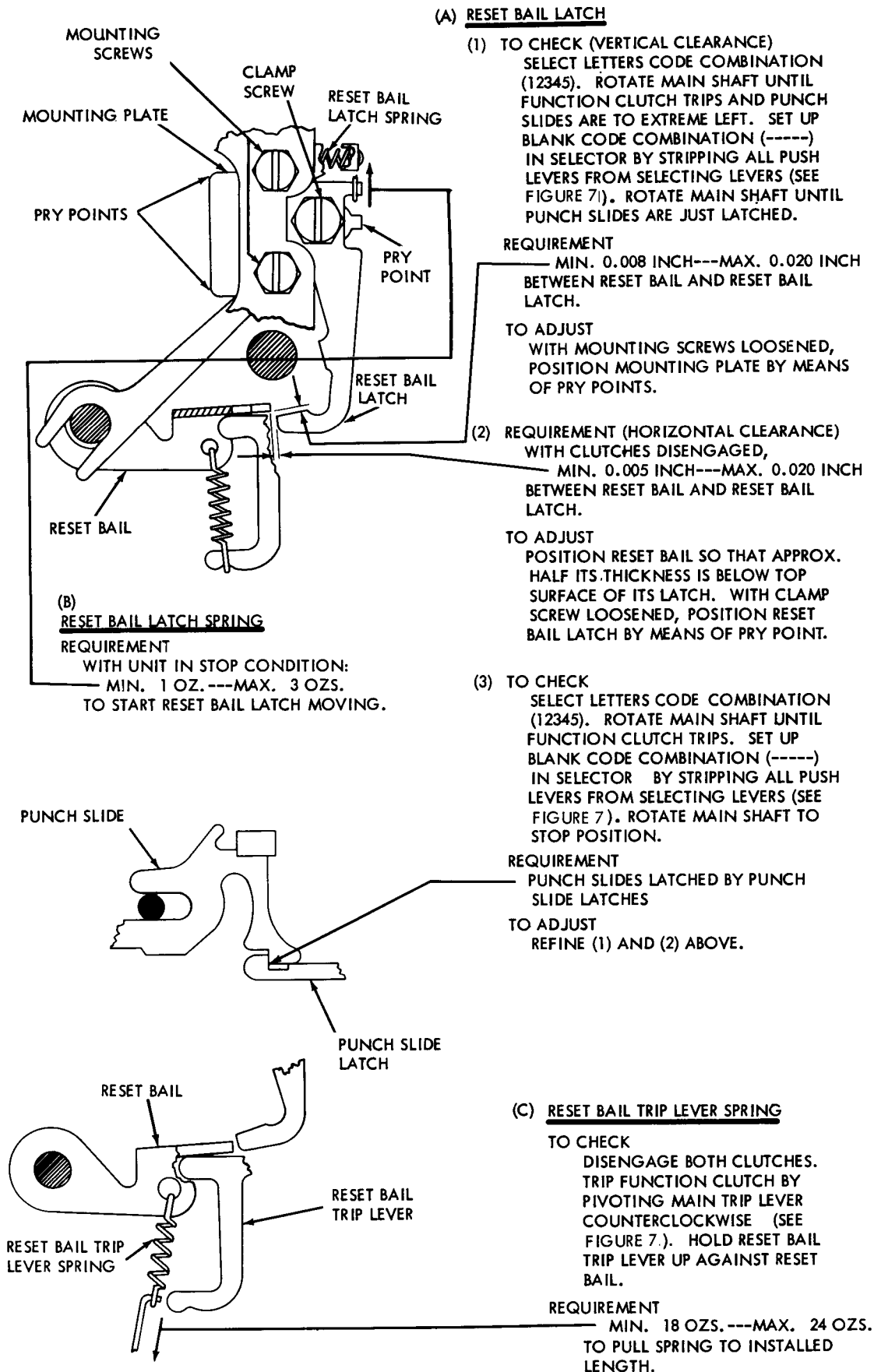


FIGURE 67. AUTOMATIC NON-INTERFERING LETTERS TAPE FEED OUT MECHANISM

SECTION 2

LUBRICATION

1. GENERAL

1.01 The reperforator should be lubricated as directed in this section. The figures indicate points to be lubricated and the kind and quantity of lubricant to be used. Lubricate the reperforator just prior to placing it in service. After a few weeks in service, re-lubricate to make certain that all points receive lubrication. Thereafter, lubricate every 500 hours of operation or every six months, whichever occurs first.

1.02 Use Teletype KS-7470 oil at all locations where the use of oil is indicated. Use KS-7471 grease on all surfaces where grease is indicated.

1.03 All felt oilers should be saturated. The friction surfaces of all moving parts should be lubricated. Over-lubrication which will permit oil or grease to drip or be thrown on other parts should be avoided. Special care must be taken to prevent any oil or grease from getting between the selector armature and

its magnet poleface or between electrical contacts.

1.04 Apply a thin film of grease to all gears.

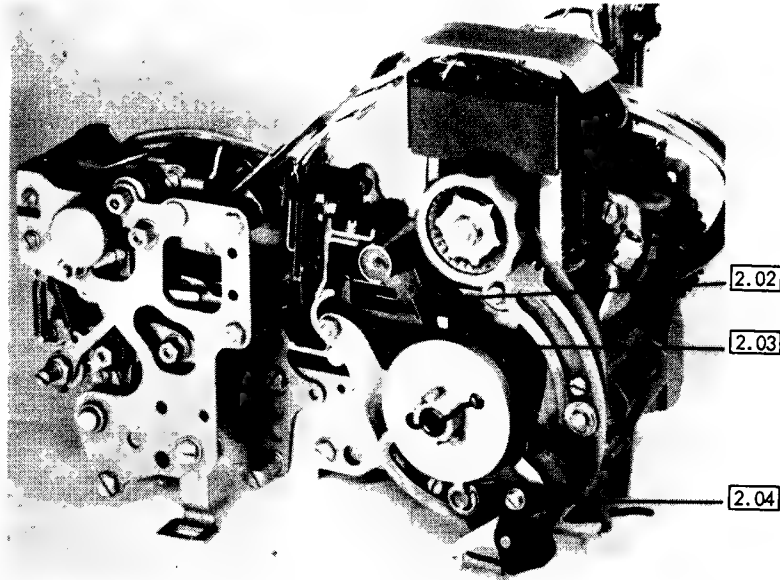
1.05 Apply oil to all cams, including the camming surface of each clutch disk.

1.06 The photographs show the paragraph number referring to particular line drawings of mechanisms and where these mechanisms are located on the unit. Parts in the line drawings are shown in an upright position unless otherwise specified.

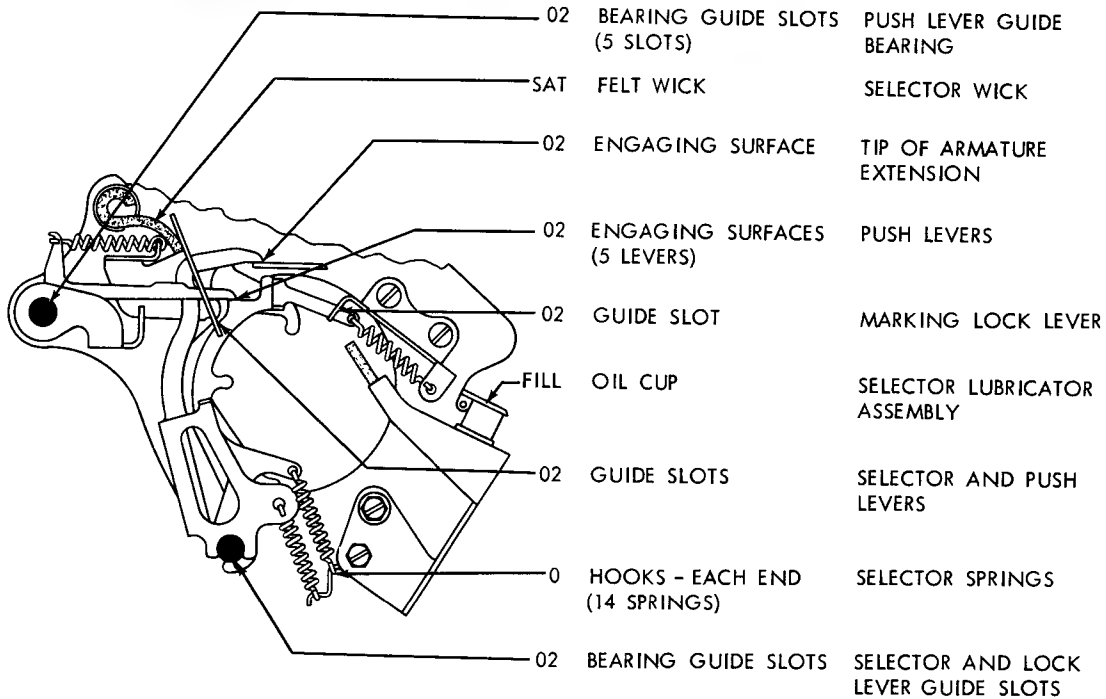
1.07 The illustration symbols indicate the following lubrication directions.

- 0 Apply 1 drop of oil.
- 02 Apply 2 drops of oil.
- 04 Apply 4 drops of oil.
- SAT Saturate with oil.
- G Apply thin film of grease.

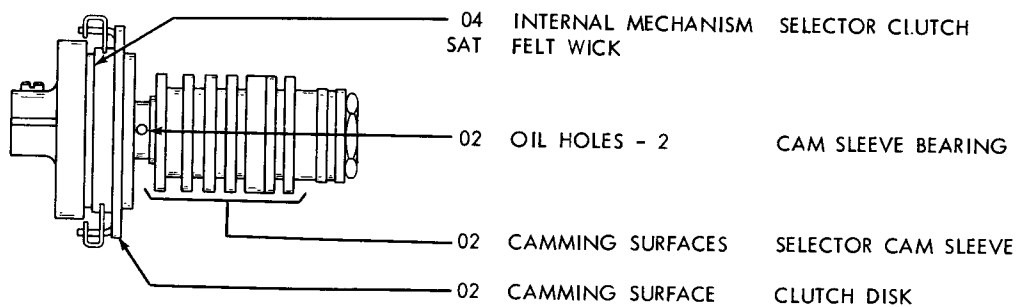
2.01 SELECTOR MECHANISM



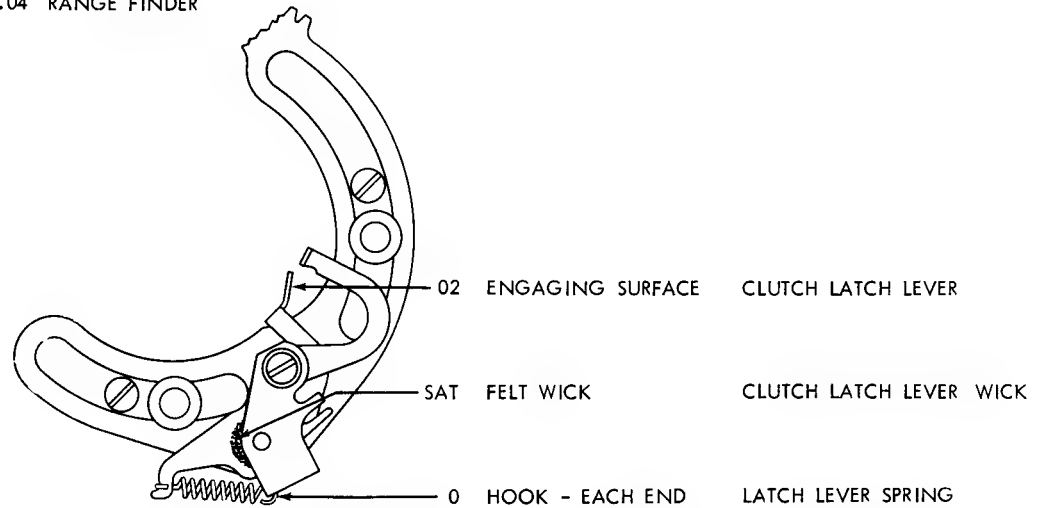
2.02 SELECTOR MECHANISM



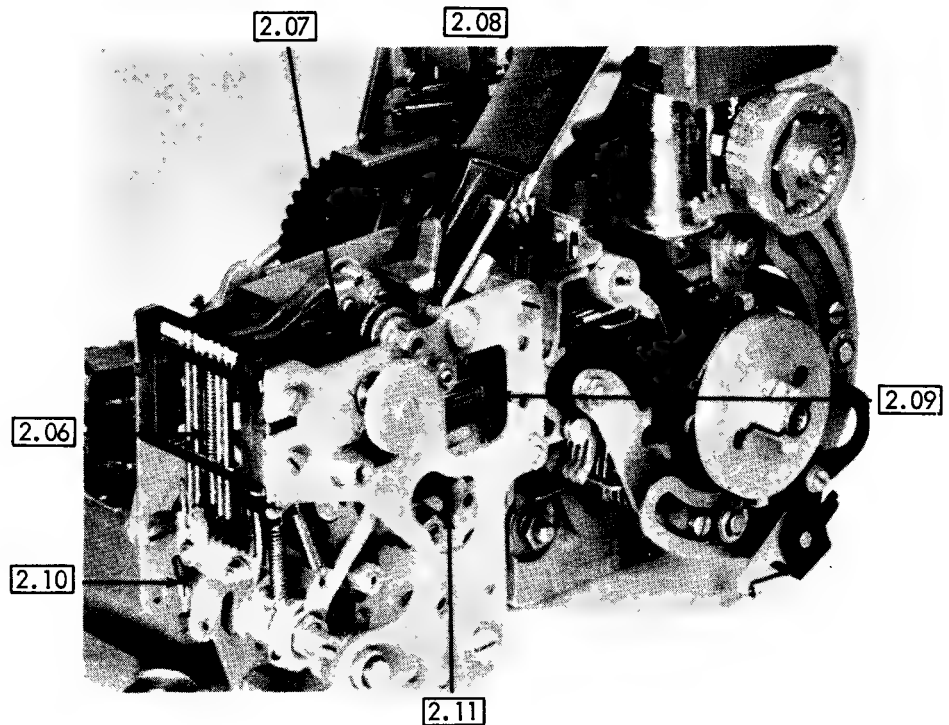
2.03 SELECTOR CAM AND CLUTCH



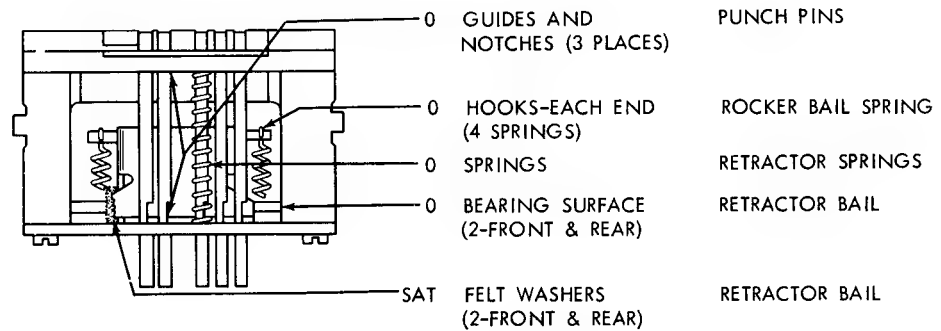
2.04 RANGE FINDER



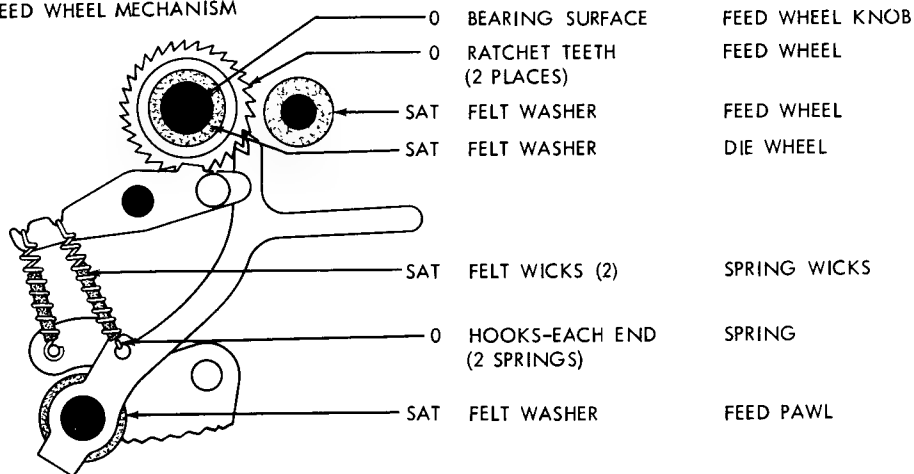
2.05 PUNCH UNIT



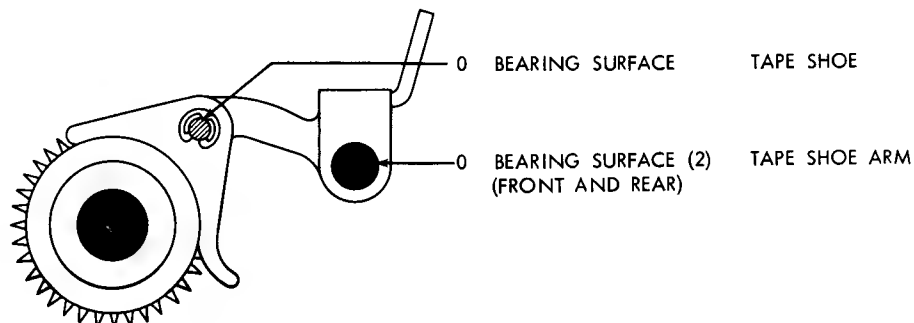
2.06 PUNCH PINS AND RETRACTOR BAIL



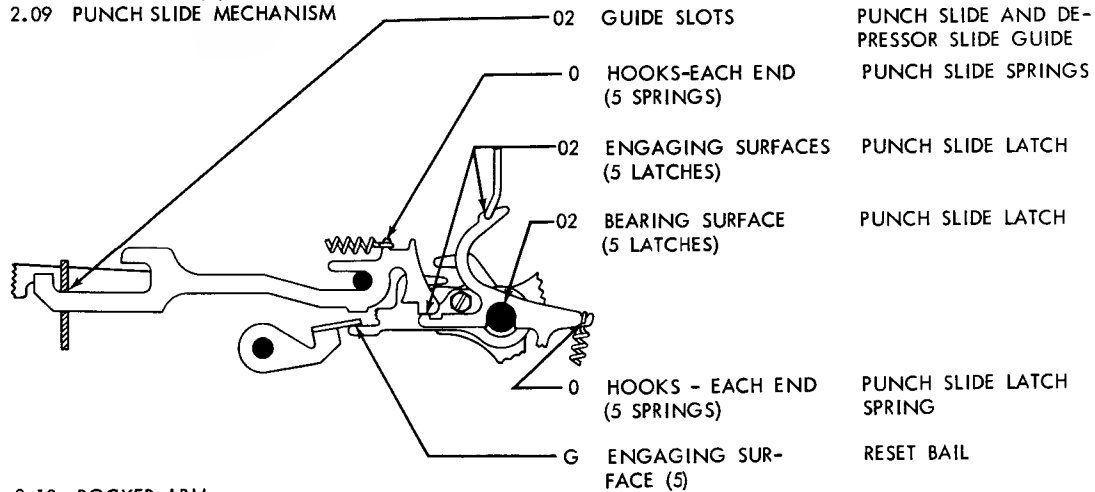
2.07 FEED WHEEL MECHANISM



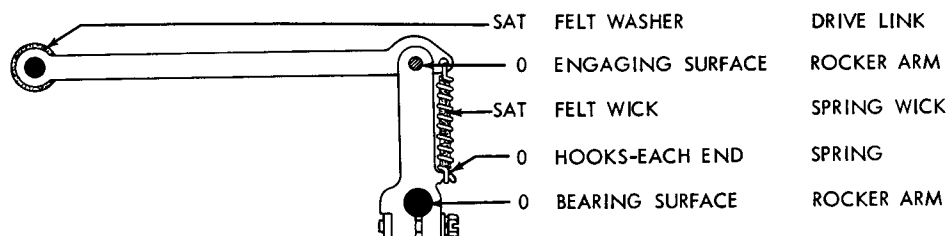
2.08 TAPE SHOE



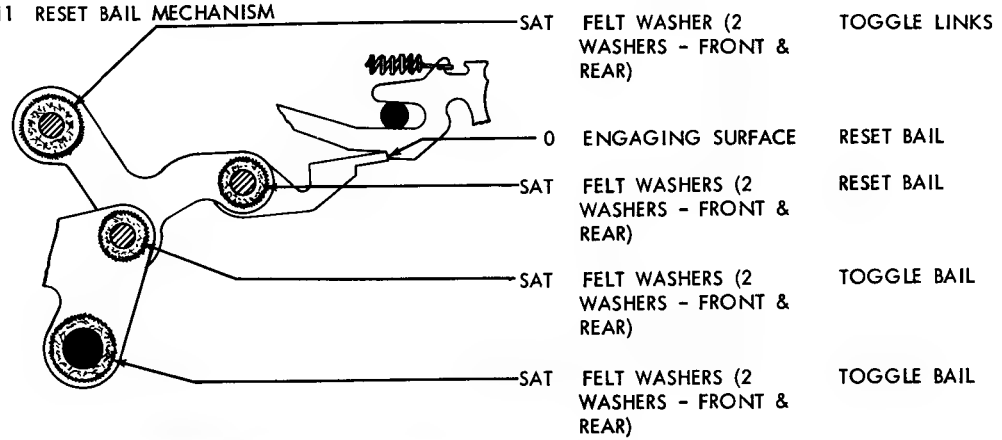
2.09 PUNCH SLIDE MECHANISM



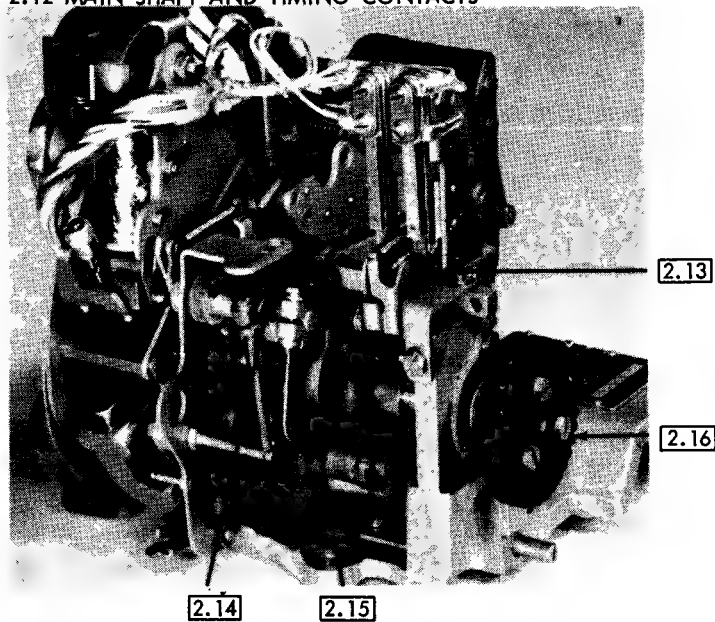
2.10 ROCKER ARM



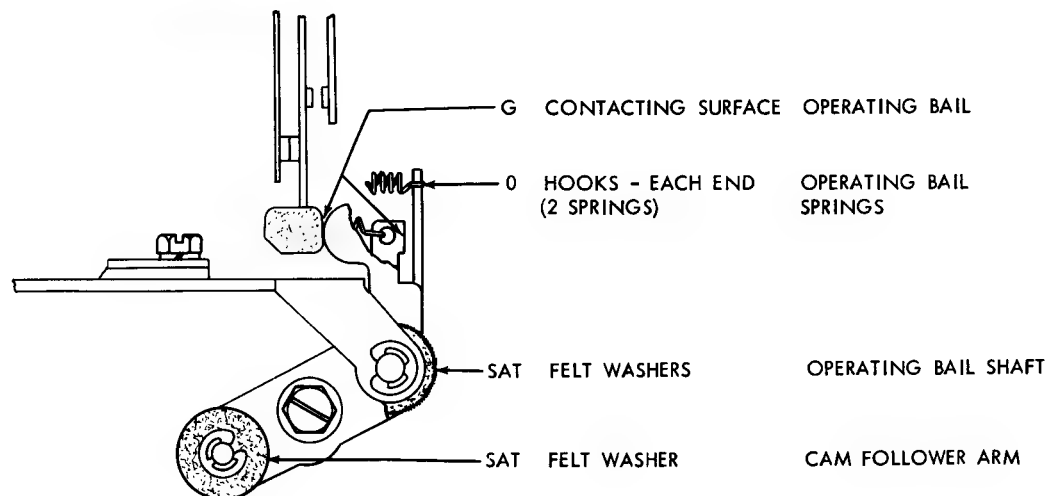
2.11 RESET BAIL MECHANISM



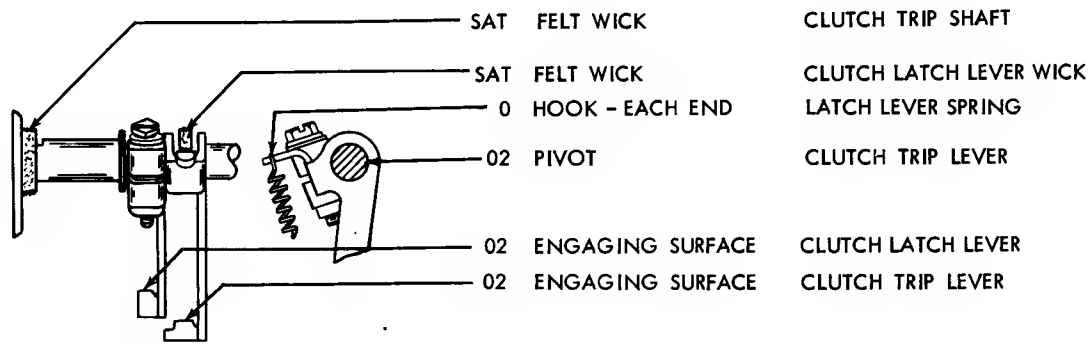
2.12 MAIN SHAFT AND TIMING CONTACTS



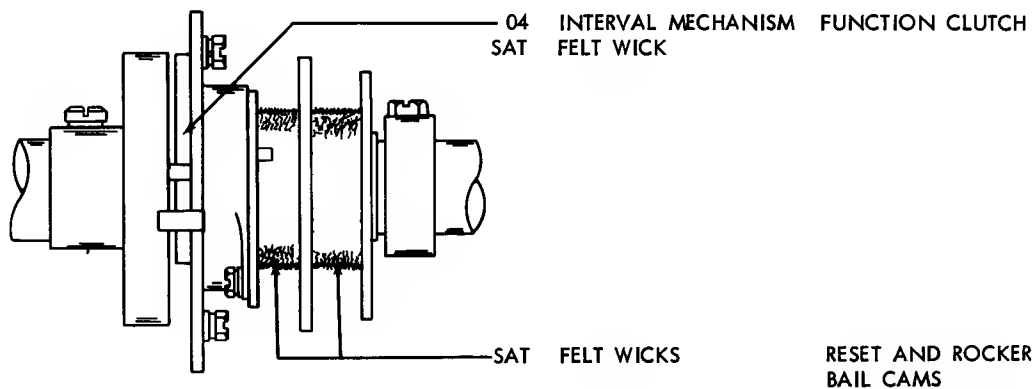
2.13 TIMING CONTACTS



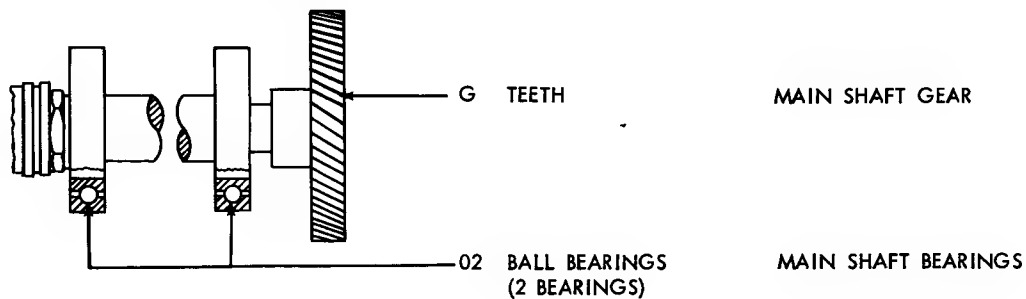
2.14 CLUTCH TRIP MECHANISM



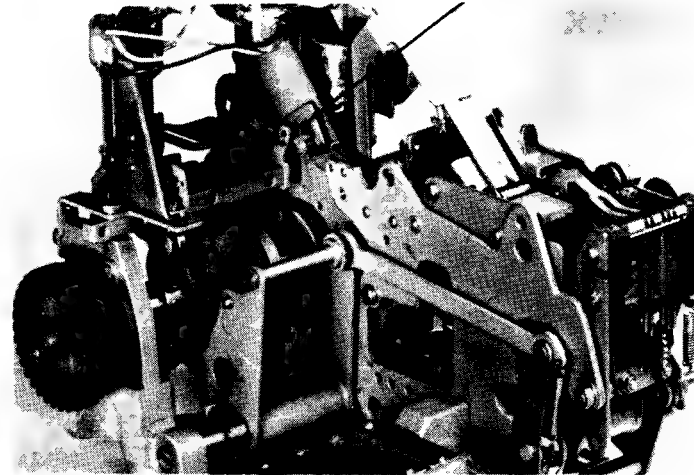
2.15 FUNCTION CLUTCH (ONE SHAFT UNITS)



2.16 MAIN SHAFT (ONE SHAFT UNITS)

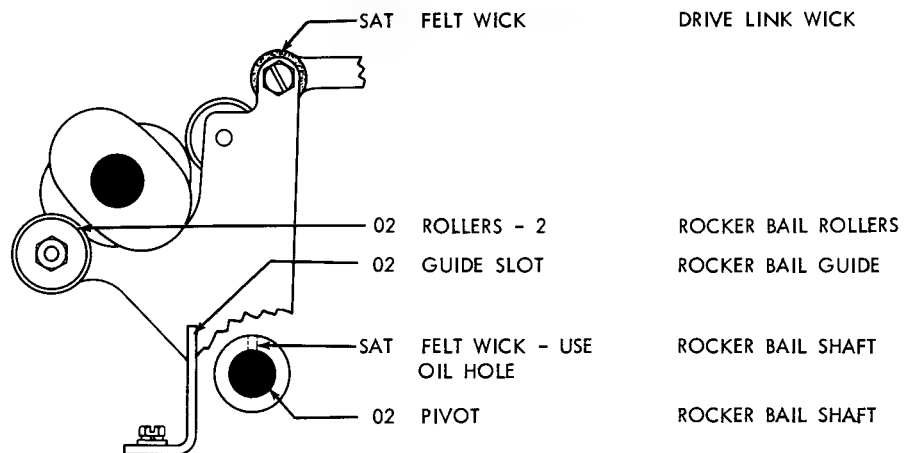


2.17 ROCKER BAIL MECHANISM

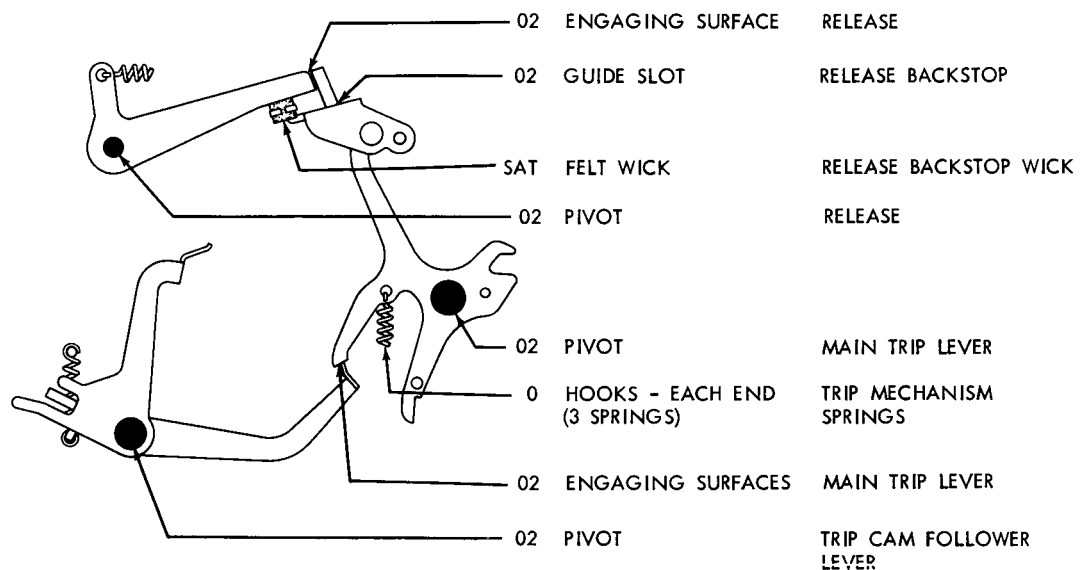


2.18

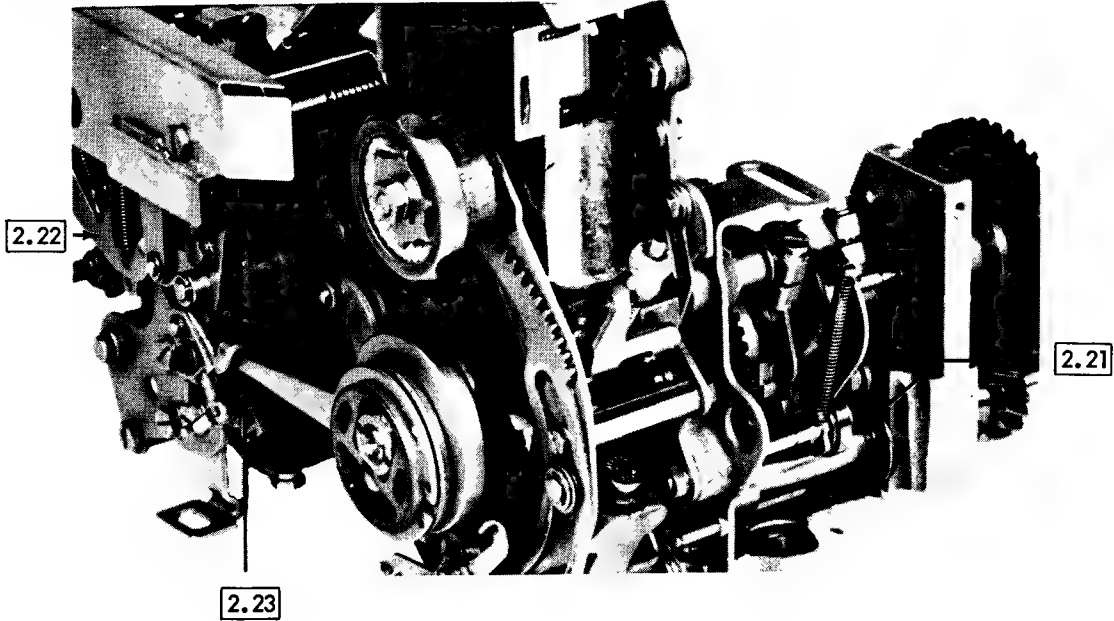
2.18 ROCKER BAIL MECHANISM



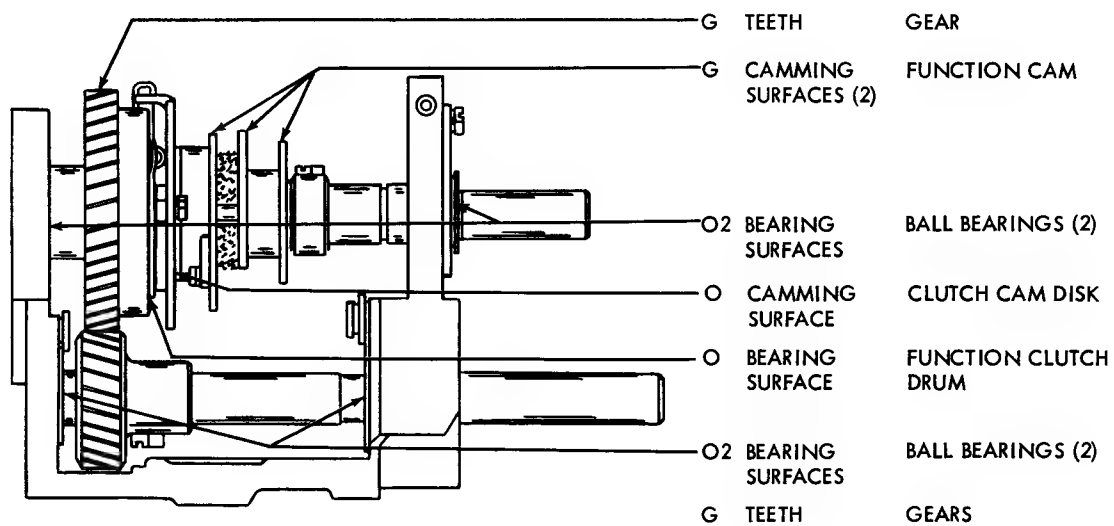
2.19 MAIN TRIP LEVER MECHANISM



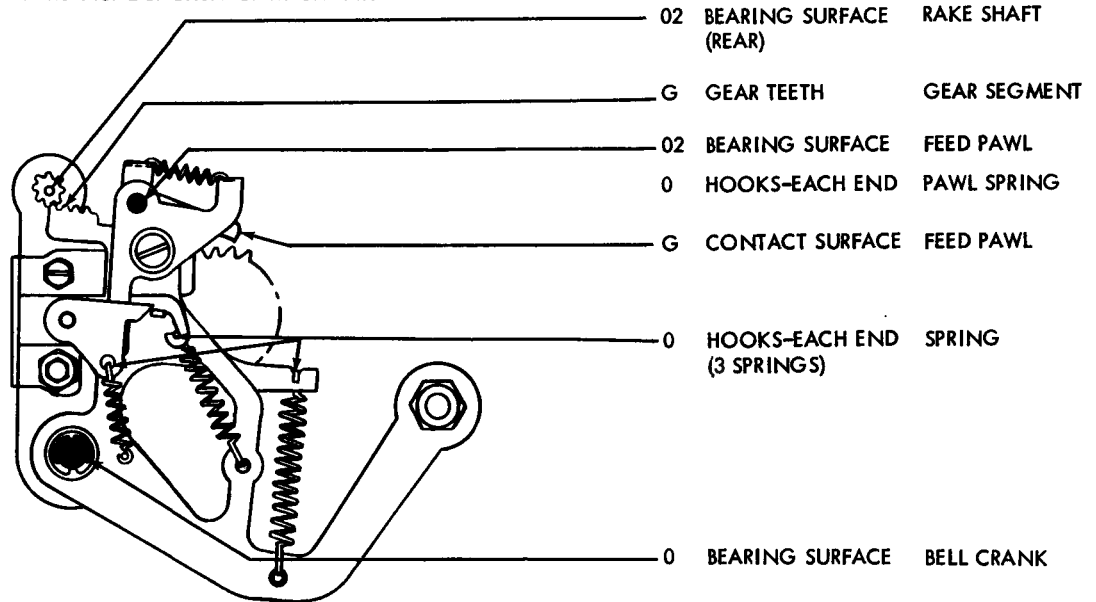
2.20 BACKSPACE MECHANISM AND MAIN SHAFT



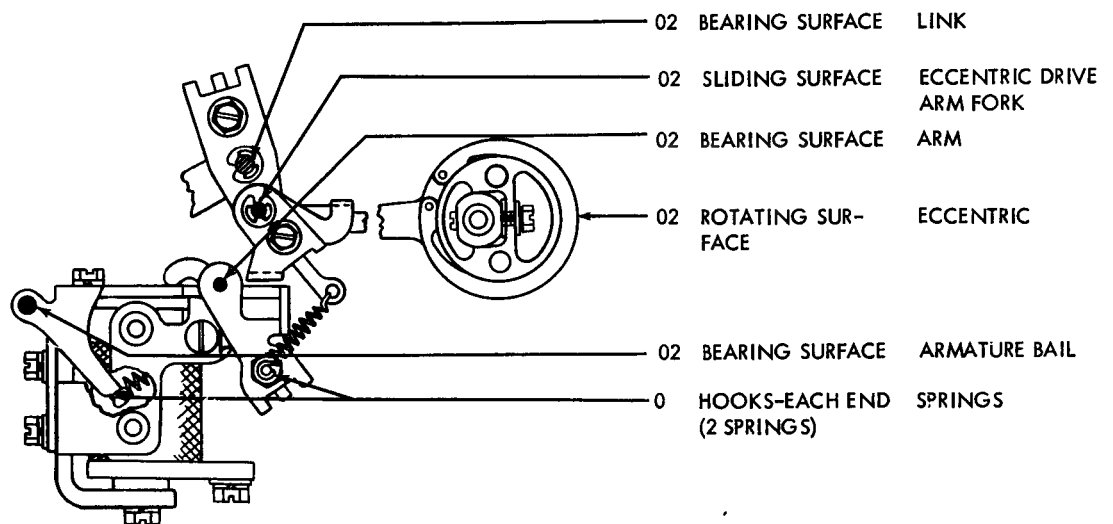
2.21 MAIN AND JACK SHAFT MECHANISMS (TWO SHAFT UNITS)



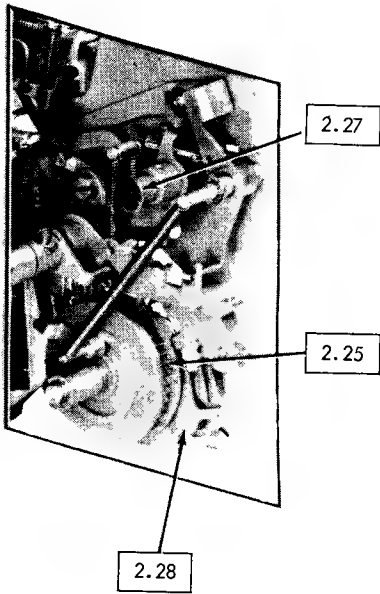
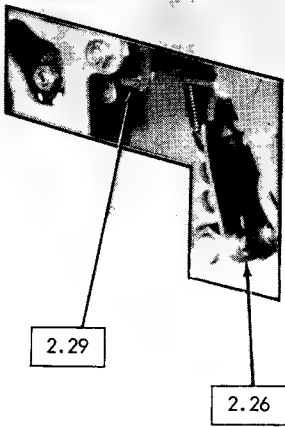
2.22 MANUAL BACKSPACE MECHANISM



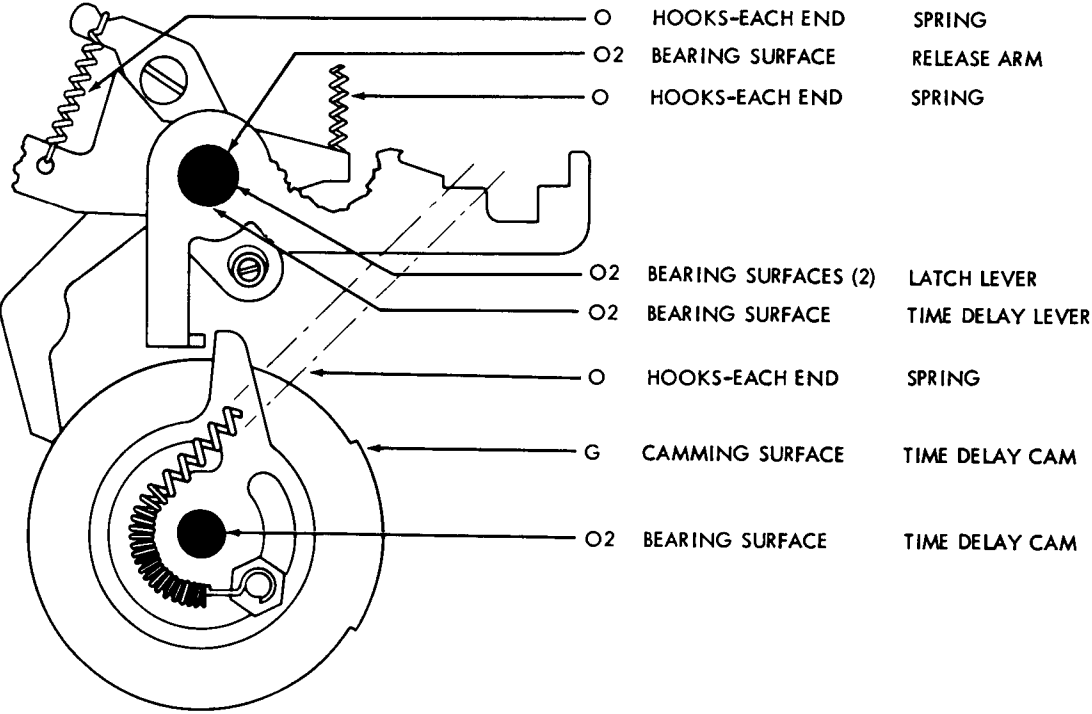
2.23 POWER DRIVE BACKSPACE MECHANISM



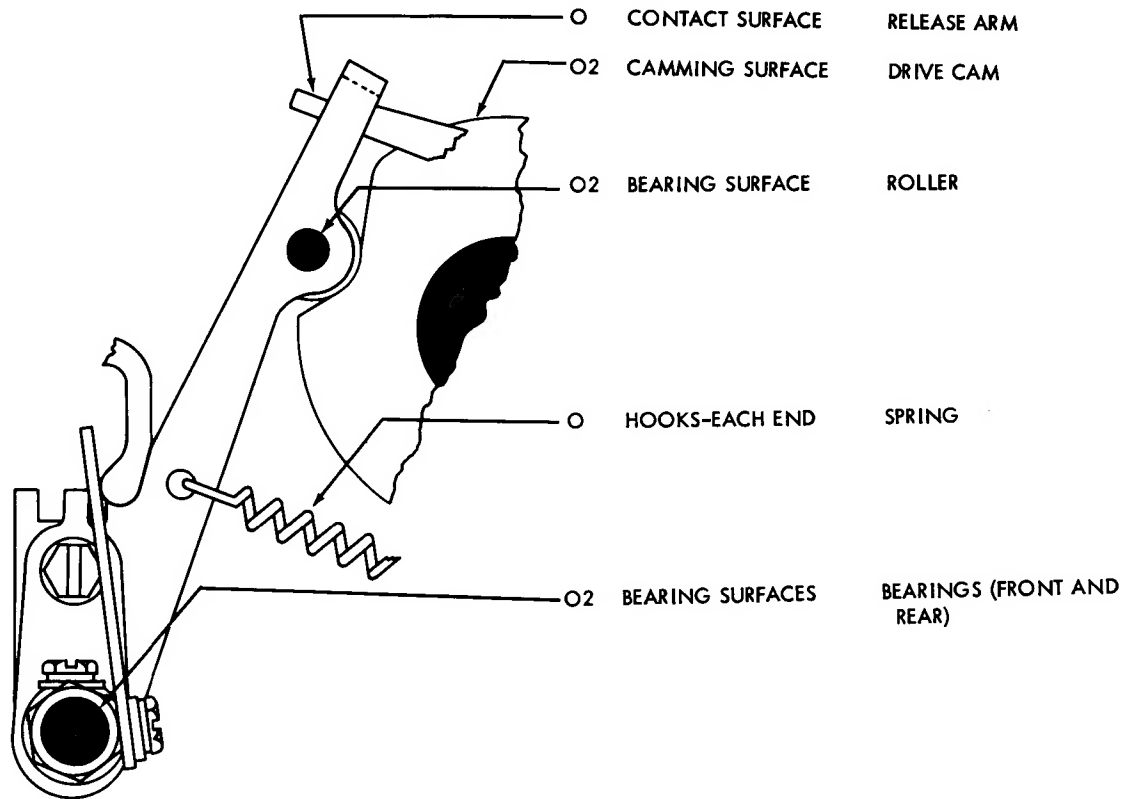
2.24 NON-TYPING REPERFORATOR



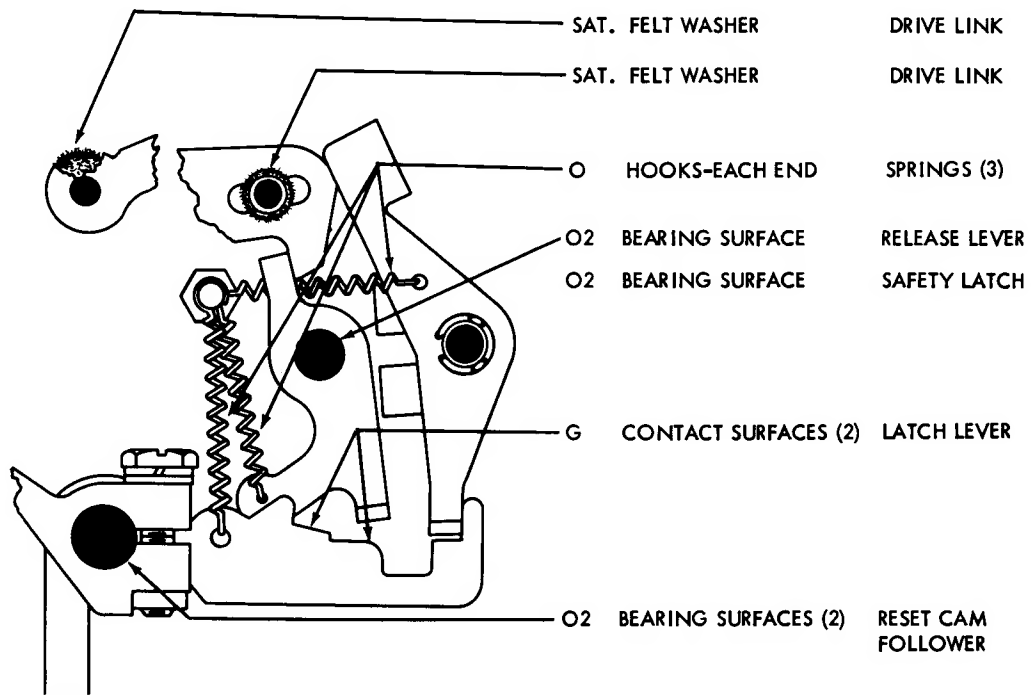
2.25 AUTOMATIC NON-INTERFERING LETTERS TAPE FEED OUT MECHANISM



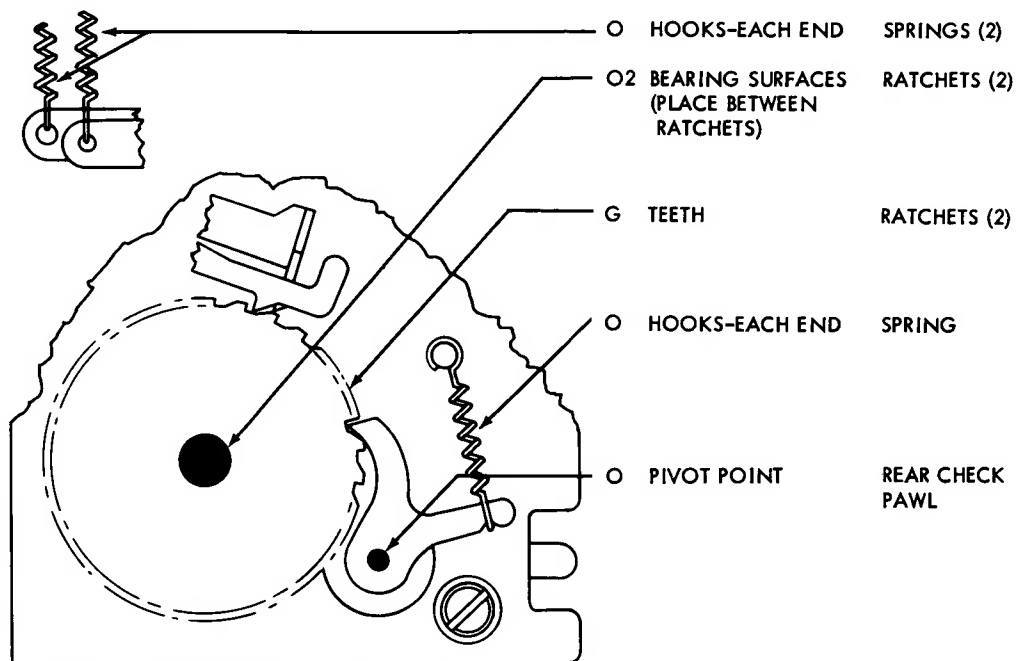
2.26 AUTOMATIC NON-INTERFERING LETTERS TAPE FEED OUT MECHANISM



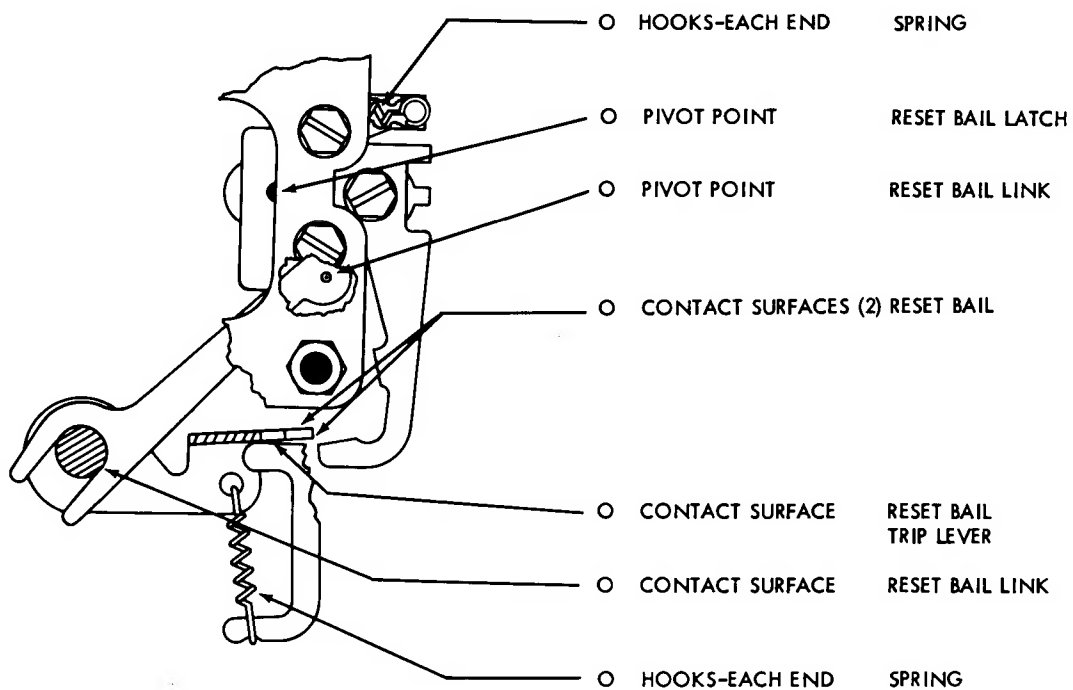
2.27 AUTOMATIC NON-INTERFERING LETTERS TAPE FEED OUT MECHANISM



2.28 AUTOMATIC NON-INTERFERING LETTERS TAPE FEED OUT MECHANISM



2.29 AUTOMATIC NON-INTERFERING LETTERS TAPE FEED OUT MECHANISM



SECTION 3

DISASSEMBLY AND REASSEMBLY

1. GENERAL

a. The disassembly procedure presented in this section will break the Model 28 Non-Typing Reperforator down into its major subassemblies. Teletype Parts Bulletin 1172B shows the complete breakdown of the unit and includes illustrations of parts referred to below.

b. If a part that is mounted on shims is to be removed, the number of shims used at each of its mounting screws should be noted so that the same shim pile-up can be replaced when the part is remounted.

c. Retaining rings are made of spring steel and therefore have a tendency to release suddenly. Loss of these rings can be minimized as follows: Hold the retaining ring by hand to prevent it from rotating. Place the blade of a suitable screwdriver in one of the slots in the retaining ring. Rotate the screwdriver in a direction to increase the diameter of the ring and the ring will come off easily without springing away.

2. NON-TYPING REPERFORATOR

a. To Remove Non-Typing Reperforator from its Base (RT set):

(1) Remove the mounting screw that secures the tape alarm cable clamp.

(2) Remove the hex mounting nut that secures the reperforator cable clamp adjacent to the reperforator 32 point connector.

(3) Remove the mounting screws that secure the 32 point connector.

(4) Remove the mounting screw that secures the 156184 anchor bracket to the base. Remove the three mounting screws that secure the reperforator frame to the base. Lift the reperforator from the base.

b. To Remove Non-Typing Reperforator from its Base (ASR set):

(1) Disconnect the leads from the selector magnet.

(2) If unit is equipped with power backspace, disconnect the leads from the backspace magnet.

(3) If unit is equipped with code reading and timing contacts, remove associated connector or disconnect leads from contacts.

(4) Loosen the two set screws on the 158020 coupling located on the 158073 rear shaft (see Teletype Parts Bulletin 1169B) and slide the coupling to the rear. Remove the mounting screw that secures the 156184 anchor bracket to the base. Remove the three mounting screws that secure the reperforator frame to the base. Carefully lift the reperforator from the base, being careful not to damage the code bar extensions or any associated springs.

c. To Remove Non-Typing Reperforator from its Base (other than RT or ASR sets):

(1) Disconnect the leads from the selector magnet.

(2) If unit is equipped with code reading and timing contacts, remove associated connector or disconnect leads from contacts.

(3) Remove the mounting screw that secures the 156184 anchor bracket to the base. Remove the three mounting screws that secure the reperforator frame to the base. Remove the timing belt from the sprocket on the rear of the main shaft. Lift the reperforator from the base.

(4) To replace the non-typing reperforator on its base:

(a) Place the reperforator on its base so that its three mounting holes line up with those on the base. On ASR sets, be careful not to damage the code bar extensions or the punch slide latches. Loosen the mounting screw that secures the 156184 anchor bracket to the punch assembly frame. Thread the previously removed mounting screw through the anchor bracket into the proper tapped hole in the base, but do not tighten the screw. Start the remaining three mounting screws through the reperforator frame mounting holes into the tapped holes in the base; do not tighten the screws. Press the anchor bracket against the base and tighten the screw that secures the bracket to the punch assembly frame. Tighten the screw that secures the bracket to the base. Tighten the three screws that secure the reperforator frame to the base.

(b) Reconnect any wires that were disconnected during the disassembly. Replace any cable clamps that were removed during the disassembly.

(c) On RT and ASR sets, refer to Bulletins 248B and 250B respectively for interrelated adjustments

between reperforator unit and base or reperforator unit and keyboard.

(d) On other than RT and ASR sets, loosen the three mounting screws that hold the intermediate drive assembly (or gear shift mechanism) on the base. Install the timing belt. Make the Timing Belt adjustment, page 1-41.

d. To Remove Selector Mechanism:

(1) Remove the screw, lock washer, and nut from the 150001 selector clutch drum. Place the 152410 or 158903 reset bail in its raised position. While holding the 152432 or 158928 stop arm and 152405 or 158902 marking lock lever to the left, grasp the cam-clutch by the cam disk (not by the drum) and pull forward while rotating the cam-clutch slowly. The cam-clutch should come off easily; it should not be forced.

(2) Unhook the spring on the 150355 function clutch latch lever. Remove the 156472 spring post by removing its lock nut and lock washer. Remove the 151442 screw and lock washer that secure the 152402 selector lever guide to the selector plate. Remove the 152457 or 159189 oil wick, and remove the 159467 wick holder by means of its mounting screw and lock washer. Remove the selector mechanism.

(3) To replace the selector mechanism, reverse the procedure used to remove it.

e. To Remove Punch Mechanism:

(1) Unhook the 82787 spring and disconnect the 156412 drive link from the 156884 rocker arm.

(2) Remove the three screws, or two screws and one stud, that secure the 156024 punch assembly rear plate to the 159472 main plate. Remove the punch assembly.

(3) If unit is equipped with power backspace, move the punch assembly to the left to disengage it

from the slot in the 159961 eccentric arm.

(4) To remount the punch assembly, reverse the procedure used to remove it. Make certain that the 156059 reset bail engages the slot in the 159430 trip lever.

f. To Remove Rocker Bail Assembly:

(1) Unhook the 82787 spring and disconnect the 156412 drive link from the 156884 rocker arm.

(2) Remove the nut, lock washer, and 156921 adjusting lever guide, and remove the 156366 rocker bail shaft. Remove the rocker bail assembly.

(3) To replace the rocker bail assembly, reverse the procedure used to remove it.

g. To Remove Main Shaft Assembly:

(1) Remove the selector cam-clutch as described in paragraph 2.d.(1) above.

(2) Remove the 87401 spring from the function clutch latch lever. Remove the retaining ring, spring washer, and flat washers from the forward end of the main shaft.

(3) For single-shaft units only, remove the screw and lock washer from the 150000 function clutch drum.

(4) Remove the screw and lock washer from the 156236 collar. Remove the screw and lock washer from the 158745 bearing clamp.

(5) Pull main shaft out toward the rear, removing the function clutch and 156236 collar in the process.

(6) To replace the main shaft assembly, reverse the procedure used to remove it. NOTE: When the main shaft is inserted into the function clutch assembly, hold the drum and cam disk firmly together so that the drum is not pushed off the clutch.